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An Evaluation of the use of Computers Within the South Dakota Cooperative Extension Service

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AN EVALUATION OF THE USE OF COMPUTERS WITHIN THE SOUTH DAKOTA COOPERATIVE EXTENSION SERVICE

BY

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This thesis is approved as a creditable and independent investigation by the candidate for the degree, Master of Science, and is acceptable for meeting thesis requirements for this degree. Acceptance of this thesis does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Dr. Richard W. Lee, Chairman,
Journalism and Mass Communications

Date

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CHAPTER I

INTRODUCTION

Many land-grant universities are beginning to adopt computer-based information systems. While some universities are well advanced in the development of such systems, others are expanding existing ones or are developing new ones.[1]

South Dakota State University is developing an existing computer-based information system. At present, many of South Dakota's 66 county extension offices use the AGNET(Agricultural Computing Network) system, a large "information utility" that provides problem-solving programs, electronic mail, and computational services to 1,300 clients and 38 states.[2]

Through the purchase of additional computer equipment, SDSU hopes to establish, operate, and maintain an integrated communication system between county extension offices and the university.

There are those within the extension service that believe the key to the success of such a system lies in the county extension staff, the ag agents and home economists, in whether they are adequately trained in using a computer in this manner. In addition, they maintain the success or failure of a computer-based information system may depend upon the attitudes of these staff members as the key users of the system.[3]

Statement of the Purpose

The purpose of this study was to discover the attitudes of South Dakota extension personnel towards the adoption of a new

computer-based communication system as a means of disseminating information to external audiences.

This study also investigated current use patterns of computers by county staff. It used these patterns of use and attitudes to make comparisons of levels of understanding, experience, and formal training with computers, along with other factors such as age, sex, job position, education, and years of employment by the extension service.

The results of this study will help the S.D. Cooperative Extension Service develop policy and direction for development of a computer-based information system. This information may also benefit extension services in other states considering such a system.

Before determining how these computerized systems might work into current communication patterns, it would be useful to review the role of the land-grant institution.

The Land-Grant Role of Information Dissemination

Traditionally, land-grant university extension services have worked with external audiences. At first, it was mainly the farmer and those involved in agriculture. Then, through the 4-H program, these universities became involved with youth. Then, it was the non-rural population. Eventually, almost all facets of the population received information in one form or another from land-grant institutions.[4]

To help carry out this function, the Cooperative Extension Service was created in 1914 by Congress through the Smith-Lever

Act. This Act provided federal funds to be matched by state sources for the purpose of dissemination of useful information in the broad areas of agriculture and home economics."[5]

As a land-grant university, South Dakota State University carries out information dissemination as one of its three primary functions of teaching, research, and extension. Thus, the Extension Service has as its mission "the dissemination of unbiased, research-proven information to the people through the methods that avoid requiring citizens to personally travel to research sites and various experiment stations across the state."[6]

In the beginning, educational and communication techniques consisted mainly of demonstrations, field days, short courses, and various types of publications like fact sheets and bulletins. New types of information technologies like film, audio-visuals, radio, and finally television have been adopted now by university information offices.[7]

Over the years, three main information delivery systems have emerged for extension services. These delivery systems are the extension bulletin, penalty mail, and the meeting.[8]

Each of these information systems has changed in recent years.

1. The extension bulletin. Once it was free to everyone. However, it is no longer free in many states, including South Dakota. Although it remains an important tool for extension educators, it no longer has the monopoly as an information source it once did.[9]

2. Penalty mail. This information delivery system has often been referred to as "free mail." However, since the early 1970s it has not been free, but rather costs the same as regular mail.[10]

3. The extension meeting. Although the meeting is still an essential tool to extension education, this information delivery system has also changed.[11]

With the advent of the computer, several opportunities arise to make it a new information delivery tool for the extension service in South Dakota. With the rising cost of newsprint and labor,[12] greater constraints on office space, and the need to transmit larger amounts of information more quickly, the prospects of using computers in the SDSU Ag Communications Office are becoming increasingly promising.

Scope of the Study

There has been much speculation on what effects computers might have on universities like South Dakota State University as knowledge production organizations.

Furthermore, the question that remains unanswered is how these computer-based information systems will affect the extension service's traditional flow of information from the university specialists and researchers through the county extension staff to its major client— the farmer.

There also exists other serious implications these computerized communication systems raise as to the mission of the land-grant institution.[13]

Pertinent questions include:

1. From the extension worker's perspective, does this computer technology hinder or ease the flow of information between extension clients and the university?

2. What are some of the useful "vehicles" in which county agents and home economists might gain valuable experience and needed information on computers?

3. What are the differences in attitudes present among extension county personnel, university specialists, and administration towards new computer technologies?

4. What types of communication and problem-solving functions are computers currently being used for in county extension offices?

5. How much time are county staff members currently using computers to carry out their extension work?

6. What factors within the county office(i.e. funding, access to computer equipment) might hinder or ease the development of these systems?

7. What sources do county staff members use to attain needed information through their work?

8. Finally, what impacts do factors like experience, understanding, and training on computers, as well as sex, attitudes, age, years of service, job position, and education have on computer use by county extension personnel?

As previously mentioned, the attitudes of extension personnel towards the adoption of these computerized information systems will be measured and compared in this study. Stuart Oskamp cites several reasons why measurements of attitudes are such a popular and useful research tool.

First, an attitude can summarize and explain many different behaviors. In addition, attitudes can, according to Oskamp, reflect the way an individual perceives the world around him.[14]

Attitudes are important in this study for another reason. In the adoption of innovations and ideas like computer-based information systems, there normally exists a time lag between the origin of a new idea and its final adoption by an individual. The two processes which bring new ideas from their source to their acceptance are called diffusion and adoption. The diffusion process is the flow of new ideas from the orginating sources to the ultimate users. The adoption process is the mental process which an individual experiences from the time he is first aware of the idea until he accepts it or rejects it.[15]

Within the diffusion of a new idea like computer-based information systems, five adoption classifications in which individuals can be categorized are "innovators, early adopters, early majority, late majority, and the laggards."[16]

The innovators are those individuals within the extension service who immediately begin using computers very early. They are the first ones to accept the new idea of a computer-based information system.[17]

Amongst the characteristics and factors present in each of these categories of adoptors, important differences exist with regard to attitudes, values, abilities, education, and income.[18] This study attempted, through the attitudes expressed, to identify variables which may hinder or help the future uses of these computerized communication systems.

This study also determined what effects levels of understanding, experience, and formal training on computers have on amounts of computer use by county personnel.

Some extension staff are experienced with computers, while others have little or no experience. Many staff members also have little understanding of the ways a computer can be used in extension work. Information from the study could help determine such things as a need for additional formal in-service training on computers for extension staff members.

Finally, the study addressed the pacing or rate of implementing these new systems into traditional communication patterns. Moving too quickly could create an antagonistic situation that damages the potential development of the new technology. On the other hand, moving too slowly may stifle development.

Justification for the Study

Whenever new information technologies are introduced(i.e. audio-visuals, radio, television), there follows a series of studies designed to examine potential uses, pitfalls, and effects on current communication patterns.

In the same manner, a study such as this is needed at this point in the development of these computer-based information systems. South Dakota State University is in the early development of computer implementation as communication tools. A study such as this can be used to make short and long term predictions about the development of these systems as they are implemented into the land-grant setting.

Null Hypothesis

There is no significant difference in the computer use of county staff members because of differences regarding the respondents' understanding of computers, position in extension, sex, computer training, longevity of computer use, education, age, attitudes about computers, factors within the county offices, and total years of service.

Limitations of the Study

The study attempted to determine some of the factors that affect computer use of county personnel, but it did not attempt to explain why these factors affect usage or the interaction of factors.

One limitation is that the study was conducted at only one university in only one state. While many of the variables which affect the extension member's use of computers in South Dakota may also affect other extension members' use of computers in other states, some distinct differences may exist.

This suggests that while some of the findings may be applicable to some states, further analysis by other extension services would help lend additional support to the conclusions reached in this study.

ENDNOTES

[1]J. Paul Yarbrough, "Impact of Computer-Based Information Systems Upon the Extension Service and Its Farmer Clients." May 18, 1981. p. 2. Iowa State University: Project Outline.

[2]Larry R. Whiting, "Communication Technology in the Land-Grant University Setting: A Focus on Computer-Based Innovations for Information Dissemination to External Audiences. Ph.D Dissertation. Library, Iowa State University, Ames, 1981. p. 168.

[3]Interview with Frank Heitland, Program Director of the S.D. Cooperative Extension Service, SDSU, Brookings, S.D. Sept. 27, 1983.

[4]Whiting, p. 49.

[5]Annual Report-1966. "Impact on South Dakota." South Dakota Cooperative Extension Service, SDSU. p. 2.

[6]Annual Report-1981. "Lending a Hand," South Dakota Cooperative Extenison Service, SDSU.

[7]Whiting, p. 50.

[8]H.G. Diesslin, "The Computer-Extension's Delivery System of the Future," American Journal of Agricultural Economics. Dec. 1981. p. 863.

[9]Ibid.

[10]Ibid.

[11]Ibid.

[12]Carolyn Marvin, "Deliverying the News of the Future," Journal of Communication. Winter 1980.

[13]Yarbrough, p.2.

[14]Stuart Oskamp. Attitudes and Opinions. Prentice-Hall, Inc., Engelwood Cliffs, New Jersey. 1977. p. 5.

Endnotes(cont.)

[15]Agri-Search, National Project in Agricultural Communications. Michigan State University, Volume 1, No. 5. October 1955.

[16]Ibid.

[17]Ibid.

[18]Ibid.

CHAPTER II

REVIEW OF LITERATURE

Increasing speed of transmission of information, reducing paper consumption, and conserving valuable office space are all reasons why the South Dakota Cooperative Extension Service is interested in implementing a computer-based information system.

Present Outlook for these Systems

Several authors believe these new information technologies will bring major social changes. Christropher Evans in his book, The Micro Millennium, predicted that before the end of the decade, computers will be so common in the business world that a business without one will be like one today without a telephone. Evans also predicted the death of the printed word by 1990 as a result of these information systems.[19]

Among those making optimistic predictions for computerized information systems is Robert Kramer, program director of the W.K. Kellogg Foundation. He predicted by the year 1990, 75 percent of all mid-sized farming operations will be using computers or programmable calculators in the decision-making process on the farm. He also predicted that "intelligent terminals" will reside in 90 percent of the county extension offices in the United States by the year 1990.[20]

In relation to the land-grant environment, some have predicted the effects of computerized information systems will bring the extension service to a crossroad in educational programming in the way information is delivered. Gerald D. Paulsen in the Journal of Extension, asserted that the extension service may soon be forced to choose between continuing face-to-face contact for the major part of its program delivery or moving towards incorporating these new information technologies.[21]

Others, like Natan Katzman in an article in the Journal of Communication, takes a more cautious view of how significant these changes will be. His position is that while some large changes may occur, there may also accompany certain negative impacts on society.[22]

Along this line, James Martin in Future Developments in Tele-Communications, maintained it would be a mistake to automate everything, as some predict will eventually happen. But rather, there will always be a need for the human element like the extension service provides with its county staff.[23]

Still others, like Craig Infanger, Lynn Robbins, and David L. Bebertin, all in the Department of Agricultural Economics at the University of Kentucky, see other potential problems in attempting to combine research and extension with these new information delivery systems. They see traditional relationships between extension, research, and clientele being altered, depending on the type of system that is developed.[24]

Yet, some in extension, like A. Gene Nelson in an article in the Journal of Extension, believe computers do have their place within extension as communication devices. However, before such systems will be effective, and can adequately serve extension purposes, they will have to be clear, speedy, and reliable.[25]

Agricultural Economist Ron E. Shaffer also cited potential shortcomings in these new systems. He maintained that users of the data generated by these systems can be misled by "inadequate data" if not properly handled. "There is a tendency to provide volumes and volumes of tables and numerous scenarios through the push of a button on a terminal, rather than to interact with the decision-maker about appropriate information for that specific situation."[26]

Finally, certain communicators believe that computerized information systems may actually create a wide social disparity and warn that caution should be exerted toward them. Since not all individuals own or have access to a computer, they assert these systems may only benefit those individuals who can afford them, or have the education to operate them.[27]

Against this backdrop of controversy and conflicting opinions, the S.D. Cooperative Extension Service is considering possible uses of these computer-based information systems to carry out its mission.

The Extension Service's Past Use of Computers

Developing and implementing computers to carry out its mission is not new to the land-grant institution. With its long

history of providing relevant information to the public, such systems would be consistent with their role of "providing useful and practical information."[28]

The extension service as well has always embraced new communication technologies. It has historically been among the leaders in adopting and developing them in an effort to discover new and innovative ways to carry out extension work.[29]

As early as 1968, the extension service was experimenting with the idea of using computers as communication devices. At Michigan State University's Farmer Week that year, a demonstration linking two teletype systems in separate locations in Michigan through a main frame computer was given. It was speculated then that by using some remote terminals like a teletype, it could provide "easy and widespread access" to computer information. It was even suggested that a county agent could hook a remote terminal with the university computer, thus making it possible for a farmer to receive information immediately. It was also said that a computer used in this type of function may even replace the printed page or the university extension bulletin room.[30]

By February of 1972, these speculations turned into prospects of reality. Ideas began appearing regularly in extension service literature about the potential uses of these systems. The burden of developing such computerized information technologies shifted to the extension workers themselves.[31]

Soon, computerized communication systems began appearing across the country. C.O.I.N., Computerized Outlook Information Network, was implemented in the summer of 1974 by the extension service at the University of Minnesota. This system disseminated crop, livestock, and other special reports to subscribers all over the Midwest. Agricultural engineers at other universities were the main subscribers to this system.[32]

The latter part of the 1970s brought other computer information systems. At Purdue, F.A.C.T.S., Fast Agricultural Communication Terminal Systems, began operation. This $1.26 million project linked every county in Indiana with a central computer at Purdue University. Through this system, up-to-date information and reports could be immediately accessed by county personnel.[33]

Another system, the "Green Thumb" project, was initiated by the University of Kentucky at Lexington. This system was designed to take the flow of information one step beyond the county extension personnel. Once the ag-related information was entered into a main computer at Lexington, it was relayed to a county micro-processor via telephone lines. Then, a farmer viewed a topic list on his own "Green Thumb Box" computer. This information was then requested from the county computer and appeared on the screen of the farmer's television set.[34]

One of the most significant computerized information systems developed to date is Nebraska's AGNET program. AGNET stands for Agricultural Computing Network. It is currently the largest and fastest growing information utility in the United States.[35] AGNET

programs are designed for problem-solving and information retrival.

AGNET has been operational in South Dakota for over five years. About 30 terminals have been purchased for the project. In addition, 12 county extension offices have purchased their own terminals.[36]

As time went on, more land-grant institutions in the United States began using computer-based information systems.

Congress soon became interested in the applications of electronic technology within agriculture. In May of 1982, Rep. George Brown(D-Calif.) chaired a series of hearings and workshops on the "Applications of Computer-based Information Systems and Services in Agriculture."[37]

Recently, the Extension Service in Washington, D.C. began an electronic mail service throughout extension offices in the United States. Eldon Fredericks, head of the Department of Agriculture at Purdue University, said "with the Cooperative Extension Service, the Cooperative State Research Service, and the Extension Service joint venture into electronic mail, we may have found the vehicle for a nationwide electronic information network."[38] Fredericks wrote, "That's the good news. The bad news is that many information offices are now playing catch up as the new technology races along."[39]

Related Studies Involving Computer-based Information Systems

Two relevant studies have been conducted recently that focus on computer-based information systems.

The first study was conducted in 1977 by Eddy LaDue, professor in the Department of Agricultural Economics at Cornell University. He studied the impact of alternative remote access computer systems on extension programs.[40]

This study investigated whether the use of computer programs via a remote access delivery system would significantly improve extension education programs, and whether the benefits were worth the cost.[41]

LaDue concluded that remote access systems can have a positive impact on extension programs. His study showed that these remote computers allowed agents to "handle problems" more effectively and provide a high quality, self-teaching tool.[42]

He also found that with this improvement in extension programs, the external image of the program quality also improved.[43]

LaDue's study did not, however, look at these computers as information delivery systems, but rather at their problem solving capabilities. In addition, those subjects used in the study were those who had previously indicated an interest in computers, so their responses may have represented an overly optimistic view of the computer's capabilities and effects.[44]

Larry R. Whiting, in a dissertation at Iowa State University, looked at computer-based innovations for disseminating information to external audiences in the land-grant setting. In his study, he examined eight land-grant universities(University of Nebraska, Oregon State University, Michigan State University, Purdue University, University of Minnesota, Iowa State University, University of Kentucky,

and Virginia Polytechnic Institute and State University) and their computer-based communications systems. In total, 12 systems were evaluated.[45]

He collected his data through interviews with persons whose central responsibilities were to maintain, operate and promote these computer systems. Therefore, it may represent overly optimistic views of the potential uses of these systems. However, he concluded that there are some concerns.[46]

He found little peer review or "gatekeeping" on the types of information that was entered into the system. There also seemed to be some disciplines that were disproportionately represented. Because of this lack of supervision over the system, there seemed to be little or no provision for preventing "erroneous data in, erroneous data out."[47]

His findings also raise serious doubts as the complexity of information or knowledge needed about these computers in order to operate them. This raises questions with regard to the equity of who will really benefit from them.[48]

Finally, Whiting identified five major areas of concern with these computer-based information systems.

1. Standards of quality. With these new systems, more people are brought into the act of information processing. In many instances, information may go directly from the source to user, thereby passing the professional communicator.

2. Sovereignty of information. With these new systems, it may become difficult to define and control copyright material.

3. Costs involved. How much should be charged for the information? In the case of land-grant universities, should they charge at all?

4. Man-machine interface problem. Can the user cope? Will this information technology create an antagonism against it by intimidating the user?

5. Technology limitations. What provisions are there to make the different types of computers available on the market today compatible?[49]

Again, as in the case of the LaDue study, information about these computer-based information systems was collected from those who were directly responsible for promoting these systems, so attitudes about potential uses of these systems may have been skewed toward the favorable side.

ENDNOTES

[19]Christopher Evans. The Micro-Millennium. The Viking Press, New York. 1979.

[20]Diesslin, p. 363.

[21]Gerald D. Paulsen, "The Secret is Out," Journal of Extension. May/June 1979. p. 33.

[22]Natan Katzman. "The Impacts of Communication Technology: Promises and Prospects." Journal of Communication. 24:4 1974.

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[24]Craig L. Infanger, Lynn W. Robbins, and David L. Berbertin, "Interfacing Research and Extension in Information Delivery Systems," American Journal of Agricultural Economics. Dec. 1978. p. 915.

[25]A. Gene Nelson, "Computers: A Service or a Teaching Tool?" Journal of Extension. May/June, 1979. p. 48.

[26]Ron E. Shaffer, "The Developing Technology of Computerized Information Systems," American Journal of Agricultural Economics. Dec. 1978. p. 913-14.

[27]Katzman, p. 25.

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[29]W.J. Whorton, "Impacts of Communication Technology," Extension Service Review, USDA. 40:16. May 1969.

[30]G.E. Rossmiller and J.L. Hervey. "What's Next for Computers," Extension Service Review. 39:4-5. May, 1968.

[31]W.J. Whorton, "Could a Computer Help You?" Extension Service Review, USDA. 40:16. May 1969.

[32]William Carnahan, "Computer Network 'COINS' Rapid Outlook Infomation," Extension Service Review, USDA. 48:8-9. January/February, 1977.

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[33]Gay White, "FACTS at County Fingertips," Extension Service Review, USDA. 49:28-29. March/April, 1978. p. 28.

[34]Randy Weckman, "Information Systems Gives Farmers a Green Thumb," Extension Service Review, USDA. 51:6-7. Summer, 1978. p. 6.

[35]Whiting, p. 169.

[36]AGNET, Fact Sheet 717. "A Computer Service at Your Finertips." South Dakota Cooperative Extension Service, SDSU. Brookings, Revised ed., 1981.

[37]Denzil Clegg, "Electronic Technology," Extension Service Review, USDA. Summer, 1982. p. 1.

[38]Eldon Fredericks and Stu Sutherland, "Computer Mail-boxes for Extension," Extension Service Review, USDA. 52:24-26. Fall, 1981. p. 24.

[39]Ibid.

[40]Eddy L. LaDue, "The Impact of Alternative Remote Access Computer Systems on Extension Programs," American Journal of Agricultural Economics. February, 1979. p. 135.

[41]Ibid.

[42]Ibid.

[43]Ibid.

[44]Ibid.

[45]Whiting, p. 2a.

[46]Ibid, p. 196.

[47]Ibid, p. 202.

[48]Ibid, p. 193.

[49]Ibid, p. 45.

CHAPTER III

METHODOLOGY

Units of Analysis

The population for this study was taken from three areas of the extension service: county extension personnel, state specialists, and extension administrators.

County Extension Personnel. Currently, there are 123 county agents and home economists in South Dakota.

State Specialists. There are 51 extension state specialists located on campus at South Dakota State University and the West River Research Unit at Rapid City.

Extension Administrators. There are 12 administrators within the structure of the S.D. Cooperative Extension Service.[50]

All the individuals mentioned above were surveyed for the study.

Methods of Gathering Data

Mail questionnaires were used to gather the data needed in the study.

The data collection process included the design and development of the questionnaires, the distribution and collection of the questionnaires, tabulation of all available data, and a final computer analysis of data.

Additional data for the study was attained on the amount of computer use on the AGNET system by county staff members.

This information was gathered from a computer-generated tabulation sheet at the central office for the AGNET system at SDSU. These data contained the hours of use and the number of "log-ons" per month.

Data Collection Instruments

One questionnaire format was used for the study and was filled out individually by each respondent in the study.

This type of self-administered instrument has several advantages. Fred N. Kerlinger, in his book Foundations of Behavioral Research, said one advantage is the honesty and frankness that can be encouraged in the responses because of anonymity. In addition, a self-administered instrument can be mailed and returned by mail, making it less expensive than other means. And finally, Kerlinger stated that this kind of instrument can be administered to a large number of individuals with relative ease.[51]

The questionnaire for county extension personnel contained five sections. Only two sections, four and five were given to state specialists and administration.

The first section pertained to what these computer-based information systems are currently being used for within the extension service.

The second section addressed the county extension member's level of understanding, training, and experience on computers. This section also contained information about sources of information about computers.

The third section pertained to various factors within the county office which might affect the use of computers(i.e. accessing the system, time requirements, and budgeting).

There were two parts in the fourth section. The first part focused on the attitudes of all extension members on potential applications of computers in extension work(administrative, educational, and communication functions). The second part pertained to the attitudes extension members expressed about how computers might affect the extension service and its land-grant mission.

In Part I of the fourth section, the respondent was asked to answer each item about his attitudes towards the usefulness of computers on a scale of "Extremely Useful, Quite Useful, Somewhat Useful, and Of Little or No Use,"

In Part II of this section, each extension member responded to the statements by "Strongly Disagree, Disagree, Agree, and Strongly Agree."

Kerlinger stated that these types of summated rating scales allow for the intensity of the attitude being expressed. This in turn results in a greater variance.[52]

The final section of the questionnaire contained general information about the extension member(sex, years employed, age, education, job position).

Upon completion of the design of the questionnaire and before publication, several copies were sent to a cross representation of

the extension service(home economist, county agents, specialist administration) to see if there were any parts that were confusing or ambiguous and appropriate changes were made.

Statistical Techniques of Analysis

The analysis of data is presented in two sections. The first section pertains to frequency counts and analysis. The second section pertains to an analysis of the variance present among selected variables on amount of use of computers by extension members.

In the first part, a frequency analysis was conducted on the data collected from the questionnaires to obtain descriptive statistics such as mean, mode, median, and standard deviation.

Simple frequency counts were used to determine current uses of computer systems, experience with computers, time required to operate computers, and basic reasons for using a computer.

Although a frequency distribution represents an organization of the data, it does not allow quantitative statements to be made about this distribution or a comparison of two or more distributions.

Richard P. Runyon, in his book, Fundamentals of Behavioral Statistics, said one way to make a quantitative statement about data is to examine it in the way it clusters around a central value. This is known as central tendency.[53]

To accomplish this, much of the data in the study was grouped by their arithmetic mean or average scores. John T. Roscoe in Fundamentals in Research Statistics, stated the "mean" is "the most useful measure of central tendency" in statistical analysis.[54]

This study used mean scores to compare the various extension groups in their responses to such items as factors within the county office, understanding of computers, sources of information and experience on computers, hours spent each week using a computer, and attitudes toward the computer's possible impact on the land-grant university.

The second part of analysis examined the data gathered in the study by analysis of variance.

There are a number of variables in the study which may account for the variance in the amount computers are used by county extension members. Those variables to be measured include: (1) factors within the county extension office; (2) longevity of member's use of computers; (3) the staff member's understanding of computers and how they can be used in extension work; (4) favorableness of attitudes of members towards their use; (5) sex; (6) age; (7) position in extension; (8) education; (9) the years of employment with the extension service; (10) training on computers.

Kerlinger said the analysis of variance has wide practical application for the researcher. It permits him to test for statistical significance in the difference of more than two groups. It also allows him to work with more than one independent variable at a time, thus becoming a powerful tool in the hands of the researcher.[55]

Computer Assisted Analysis

The computer at South Dakota State University's Central Data Processing Department was used to analyze the data in the study.

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To assist in this analysis, the Statistical Package for the Social Sciences was used. This is a system of computer programs designed specifically for analyzing social science data.[56]

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[50]Extension Mailing List, College of Agriculture and Biological Sciences, South Dakota State University. July 12, 1982.

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[52]Ibid, p. 496.

[53]Richard P. Runyon and Audrey Haber. Fundamentals of Behavioral Statistics. Addison-Wesley Publishing Co., Mass. 2nd. ed. 1972. p. 54.

[54]John T. Roscoe. Fundamentals of Research Statistics, Holt, Rinehart and Winston, Inc. New York. 1969. p. 38.

[55]Kerlinger, p. 222.

[56]Norman Nie, Dale Bent, and C. Hadlai Hull, SPSS: Statistical Package for the Social Sciences, New York: McGraw-Hill Book Co., 1970.

mailing list used. Of the 123 questionnaires sent to county staff, 106 were returned, seven were not and ten were voided because of termination of employment.

In total, of the 186 extension members surveyed in the study, 162(87 percent) returned a questionnaire, 12(6.5 percent) did not, and 12(6.5 percent) were voided.

General Information about the Extension Member

As previously mentioned, there were 162 extension members who returned questionnaires.

Of these, 56 were county agents, 50 were home economists, 45 were state specialists, and 11 were administrators.

Of the respondents, 103(64 percent) were male, 59(36 percent) were female.

In the age category, 18(eleven percent) of the extension members were under the age of 26 years. There were 50(31 percent) members in the second group, 26-to-36 years. Thirty-six(23 percent) were in the 36-to-45 age group, while 33(20 percent) members were in the 46-to-55 age group. Twenty-three(14 percent) said they were over the age of 55.

Extension members were also divided into groups according to years of service to the extension service. The largest group included 50 respondents in the "Under 5 years" category, representing 33 percent of the total. Other groups included: five-to-ten years, 34(21 percent);

eleven-to-15 years, 14(nine percent); 16-to-20 years, 24(15 percent); 21-to-25 years of service, ten(six percent); and, over 25 years of service, 26(16 percent).

Finally, respondents were divided into four groups according to education levels. Ninety-nine(63 percent) of the total extension staff surveyed have a Bachelor's degree, while 39(25 percent) have completed their Master's degree. Eighteen(Eleven percent) have a Ph.D degree and two(one percent) indicated the "Other" category (Master's of Divinity, Doctorate of Veterinary Medicine).

Percentages of Time AGNET Terminals are in County Offices

To determine the availability of a computer in the county office, respondents were asked what percentage of time there is an AGNET terminal available.

Table 1 shows the state of South Dakota divided into its 66 counties. Twenty-five(38 percent) of these counties have a computer terminal all the time within their county offices. Of these 25 counties which have an AGNET terminal all the time, seven(eleven percent) are west river, and 18(27 percent) are east river.

Many of the counties share AGNET terminals with neighboring counties. Of the total number of South Dakota counties, eleven (17 percent) reported they have a terminal less than 50 percent of the time.

Ten counties(15 percent) reported they have a terminal 50 percent of the time. Four of the counties(six percent) have an AGNET terminal more than 50 percent of the time.

There were 16 counties(26 percent) that do not have an AGNET computer terminal at all.

In addition to these counties having the AGNET terminals within their offices, respondents were also asked whether they had a computer other than the AGNET terminal. A total of nine(14 percent) counties reported they have a computer that is either in addition to or replacement of the regular AGNET terminals.

Computer Use by Month

Data were gathered from a computer-generated tabulation sheet at the central office of the AGNET computer system located at SDSU on the amount of use on computers by county extension personnel.

Data were collected in two forms. One form was the amount of log-ons per month on the AGNET system, and the other form was the total hours the system was used.

Table 2 shows the peak months of log-ons on the AGNET system by county staff are January, February, and March. Fifty-two percent of the total log-ons were recorded in these three months.

Table 3 shows the hours of use on the AGNET system to be similar to the number of log-ons. The peak months of use were also January, February, and March.

One possible reason for these peak-use months may be directly linked to AGNET's clientele. Because AGNET serves a large agricultural clientele, many of the programs are designed for planning purposes. For many farmers, this planning period occurs in late winter early

TABLE 2

USE OF AGNET BY LOG-ONS DURING JUNE, 1982 THROUGH MAY, 1983.

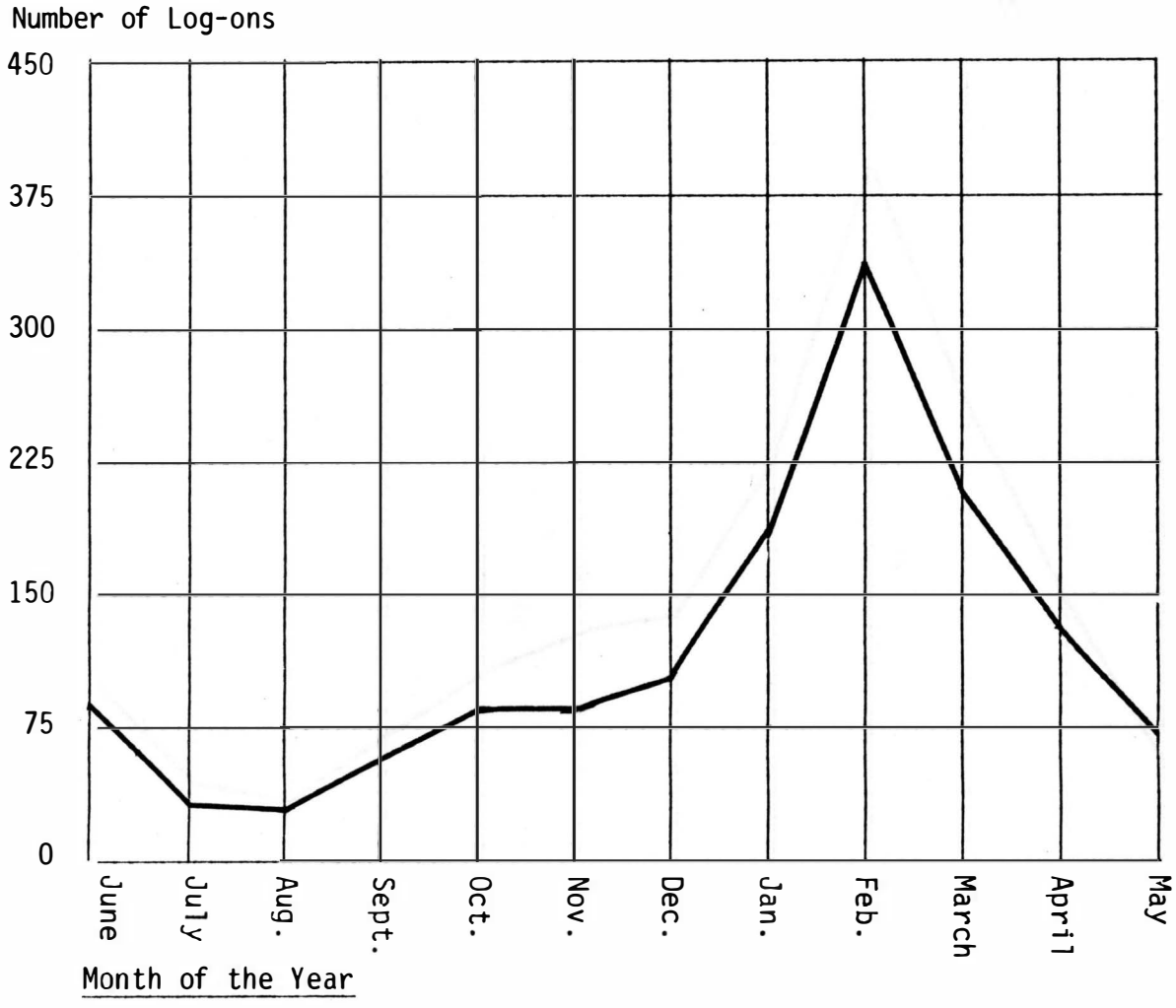
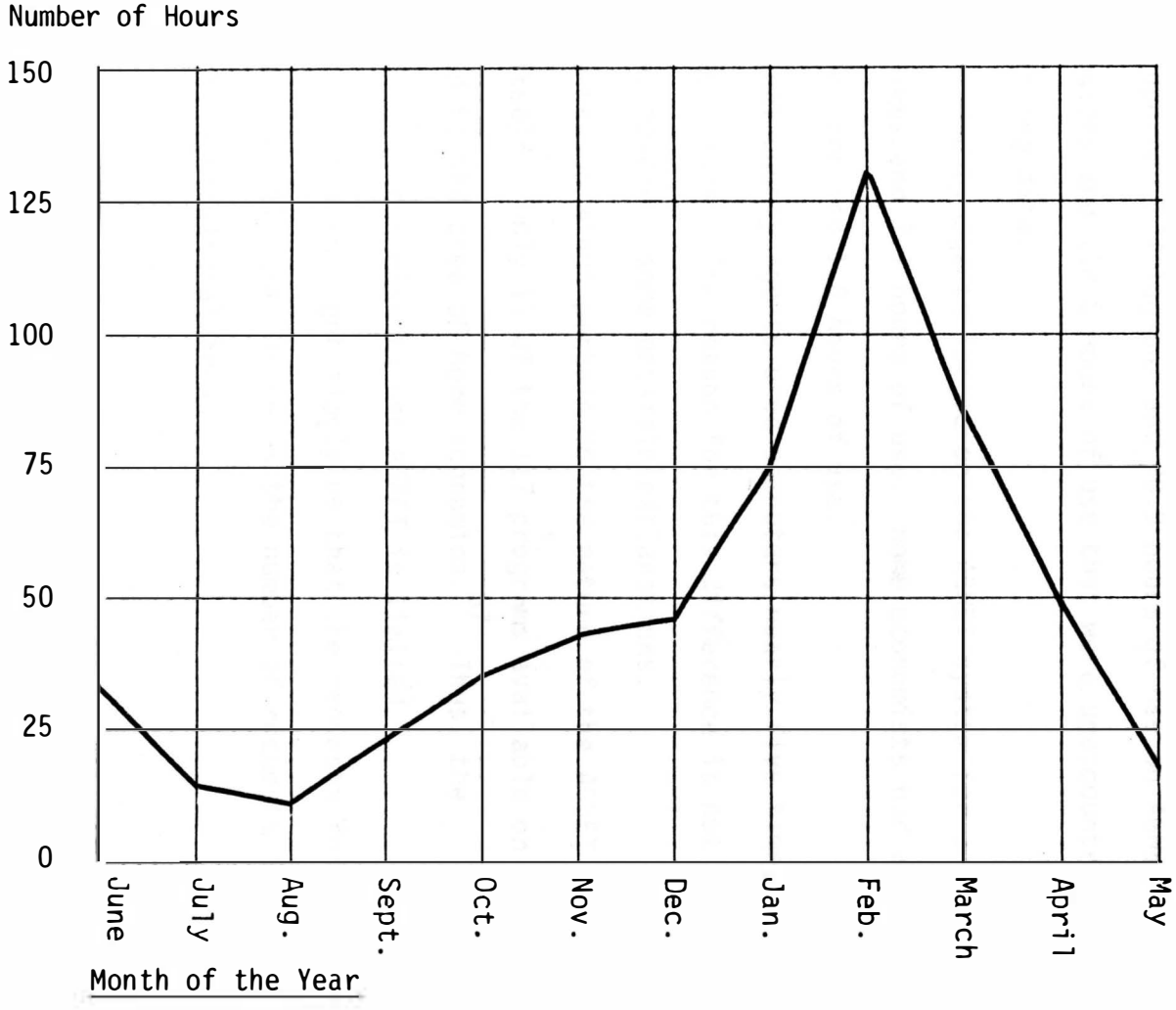


TABLE 3

USE OF AGNET BY HOURS DURING JUNE, 1982 THROUGH MAY, 1983



spring. This situation raises a question as to the danger of congestion of use on this system and other systems like it.

There were a total of 1,429 log-ons and 556 hours of use during the 12 month period of the study. The monthly average totaled 119 log-ons and 46.3 hours of use.

County agents reported 934 log-ons and 367 hours of use, while home economists reported 174 log-ons and 70.3 hours of use on AGNET. There were 321 log-ons and 118.5 hours of use that were unaccounted for because of missing data.

Individually, county agents logged-on the AGNET system for an average of 19.5 times and 7.7 hours of use. Home economists had an average of four log-ons and 1.6 hours of use.

This means that county agents used computers nearly five times more than home economists. The reason for this difference is not known. There are, however, some possible explanations.

One possible reason might pertain to the nature of the AGNET computer system itself. Only 11 of the 117 programs available on the system are related to the area of home economics.[57] Thus, the opportunity for a home economist to use AGNET is limited.

Another possible reason might simply be that the requests for program runs from clientele are far below the number of requests for program runs in the agricultural areas.

Training on Computers

Many believe one of the primary tasks of the state extension program director* in regard to computer use within the land-grant setting will be insuring the users of these systems are adequately trained.

Several items in the questionnaire addressed this concern of training extension personnel in the use of computers.

Sources of Experience and Information on Computers

Respondents were asked where they gained experience and information on computers. This focused on two points. One point asked county staff members what was the single best source of information and experience on computers from a list of choices. The other point asked respondents to rate the sources on a scale from one(None) to five(Much), as to how much experience and information they gained from that source.

Table 4 shows that workshops were the single best source of information on computers. Forty-four(51 percent) of the county agents and home economists indicated this source as the best source. The percentages in other sources included: co-workers, 18(21 percent); other, ten(12 percent); magazines and newspapers, six(seven percent); books and manuals, five(six percent); computer dealers, three(four percent); computer exhibits, none.

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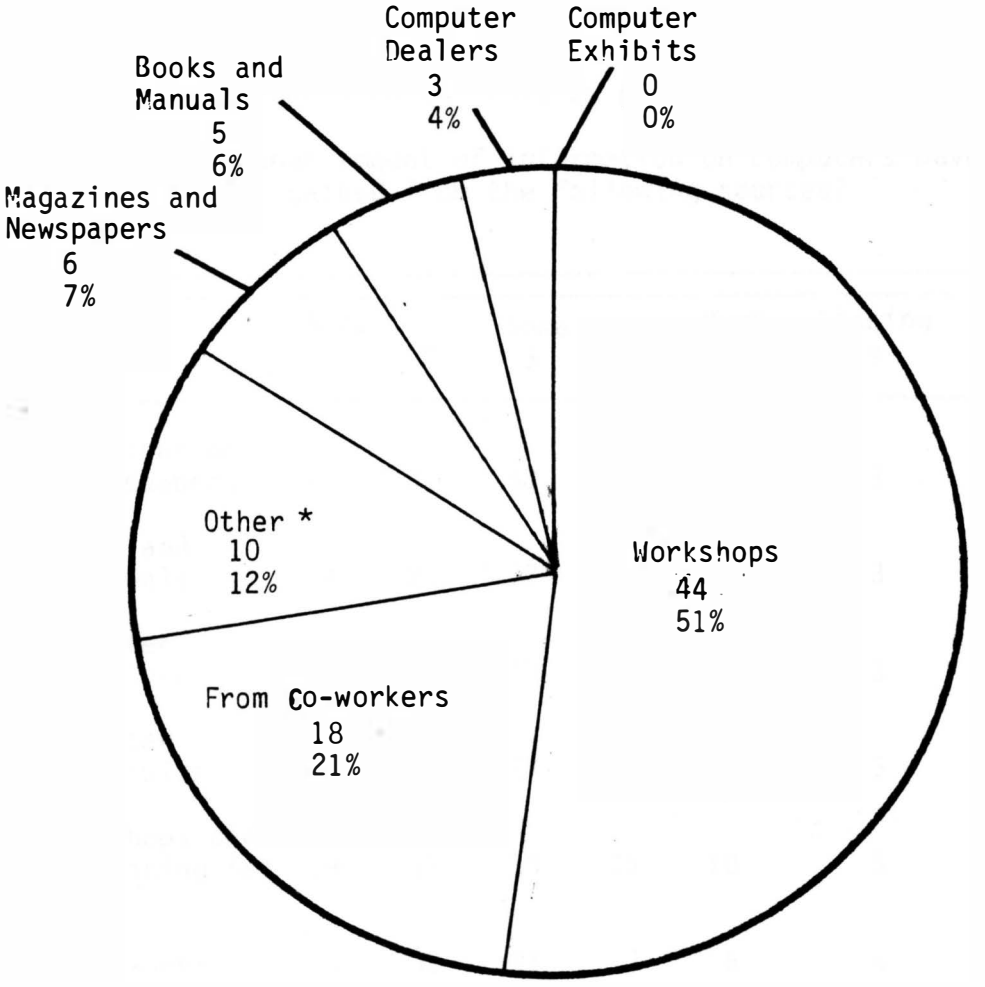
*The Extension Service Program Director is the person primarily responsible for program development and in-service training of personnel.

TABLE 4

BEST SINGLE SOURCE OF INFORMATION ON COMPUTERS



* "Other" category included items like: Adult Education Training, undergraduate work, seminars, and 4-H education programs, each accounting for less than one percent of the total.

When county staff rated each source on information individually, workshops and training sessions again rated highest. Co-workers were rated second by respondents(See Table 5)

TABLE 5

SOURCES OF INFORMATION ON COMPUTER FOR COUNTY STAFF

Question: What amount of information on computers have you gained from the following sources?

	None 1	2	Some 3	4	Much 5	Missing 9	Mean
Magazines and Newspapers	22	31	39	10	1	3	2.388
Books and Manuals	34	23	32	8	6	3	2.311
Computer Dealers	39	25	27	11	1	3	2.126
Computer Exhibits	49	20	27	6	1	3	1.932
Workshops and Training Ses.	19	13	35	25	10	5	2.960
From Co-workers	14	33	31	7	5	6	2.660
Other Sources	89	1	4	2	6	4	1.382

Seventy of the respondents(68 percent) indicated they only use magazines and newspapers some as a source of information on computers while 22 members(21 percent) do not use this source at all. In the

other printed sources of information(books and manuals), 55 extension members(53 percent) said they only used it some, and 34 members(33 percent) did not use it at all to obtain information on computers.

Other sources like computer dealers and exhibits were used even less than the printed sources. Thirty-nine respondents(38 percent) said they attained no information from dealers, while 49 members (48 percent) said they attained no information from computer exhibits.

Table 6 shows 48 county staff members(55 percent) felt that workshops and shortcourses were also the single best source of experience on computers. Responses and percentages in the other sources of experience included: current job, 14(16 percent); other, nine(ten percent); undergraduate course, eight(nine percent); graduate course, five(six percent); and previous job, four(five percent).

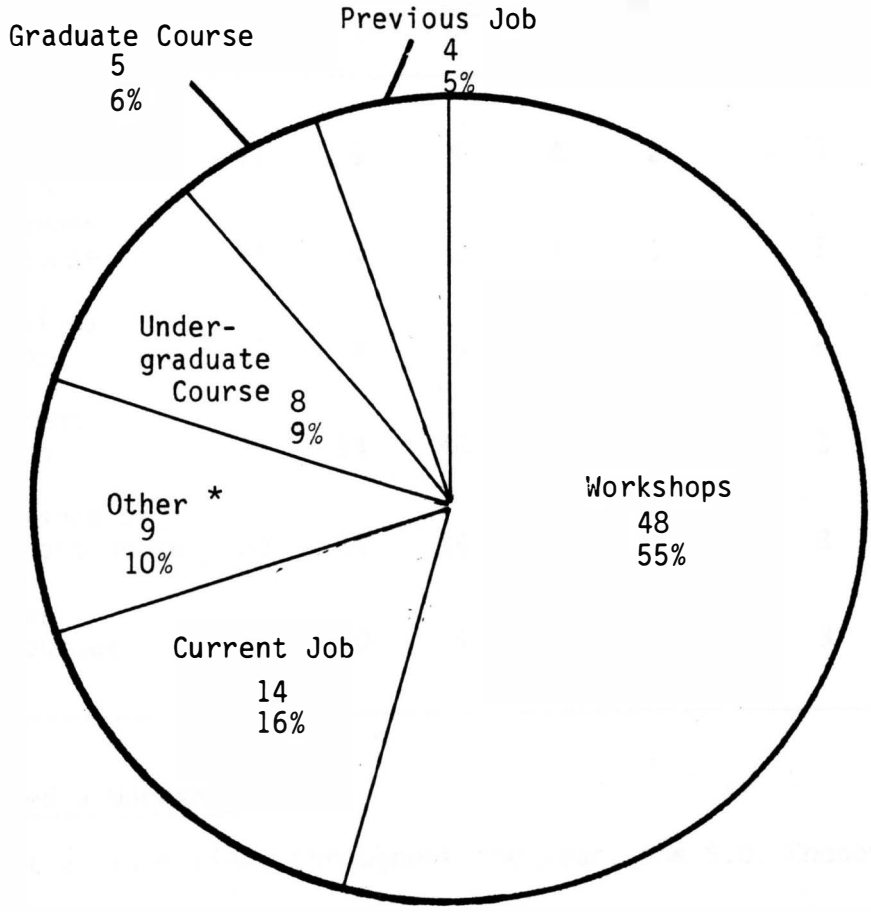
When each source was rated individually by county staff, the workshop was rated highest and current job was rated second.

Table 7 shows 83 respondents(81 percent) did not gain any experience from undergraduate courses. In addition, 93 staff members (90 percent) indicated they gained no experience from a graduate course. Part of this may be contributed to the fact that many county extension personnel have never taken a graduate level course.

Eighty-seven respondents(86 percent) said they gained no experience on computers from their previous job. Again, part of this might be explained by the reason that for many county personnel, their current position with the S.D. Cooperative Extension Service is their first place of employment.

TABLE 6

BEST SINGLE SOURCE OF EXPERIENCE ON COMPUTERS



*"Other" category included items like: self-taught, Adult Education Training, other agents, and seminars, each accounting for less than one percent of the total.

TABLE 7

SOURCES OF EXPERIENCE ON COMPUTERS FOR COUNTY STAFF

Question: What amount of computer experience have you gained from the following sources?

	None 1	2	Some 3	4	Much 5	Missing 9	Mean
Undergraduate Course	83	5	9	4	2	3	1.417
Graduate Course	93	0	8	1	1	3	1.223
Previous Job	87	4	6	3	1	5	1.287
Current Job	25	14	50	9	6	3	2.587
Workshop or Shortcourse	20	11	54	12	6	3	2.738
Other Sources	92	0	4	4	3	3	1.330

Attended a Workshop

At various times throughout the year, the S.D. Cooperative Extension Service hosts a series of workshops on the use of computers for in-service training.

Seventy-nine county staff(75 percent) said they had attended a computer workshop in the last 12 months. A slightly greater percentage of county agents(77 percent), said they had attended a computer workshop than home economists(72 percent).

Current Uses of Computers

One section of the questionnaire asked county extension personnel to report the number of times each month they used a computer to accomplish various tasks.

Table 8 shows the number of respondents in each category by times used for each application. The majority of respondents in each of the suggested applications were using the computer less than once a month. These applications can be divided into five separate categories They include: 1) educational; 2) problem-solving; 3) communication; 4) administrative; 5) miscellaneous.

Educational Applications

Thirty-eight county staff(37 percent) used a computer each month for individualized instruction. There were 23 respondents who used a computer in preparation for instruction.

Problem-Solving Applications

There were four suggested applications of computers in the problem-solving category: analysis for clients, other assistance for clients, model building, and predicting prices and trends.

Analysis for clients was the most used application in all categories. Forty-seven county staff members(47 percent) used the computer for this application. This response was expected because the structure of the AGNET system is designed mainly to serve farmers.[58]

Fifteen respondents(15 percent) said they used a computer each month for other assistance for clients. Model building was the least

TABLE 8

CURRENTS USES OF COMPUTERS

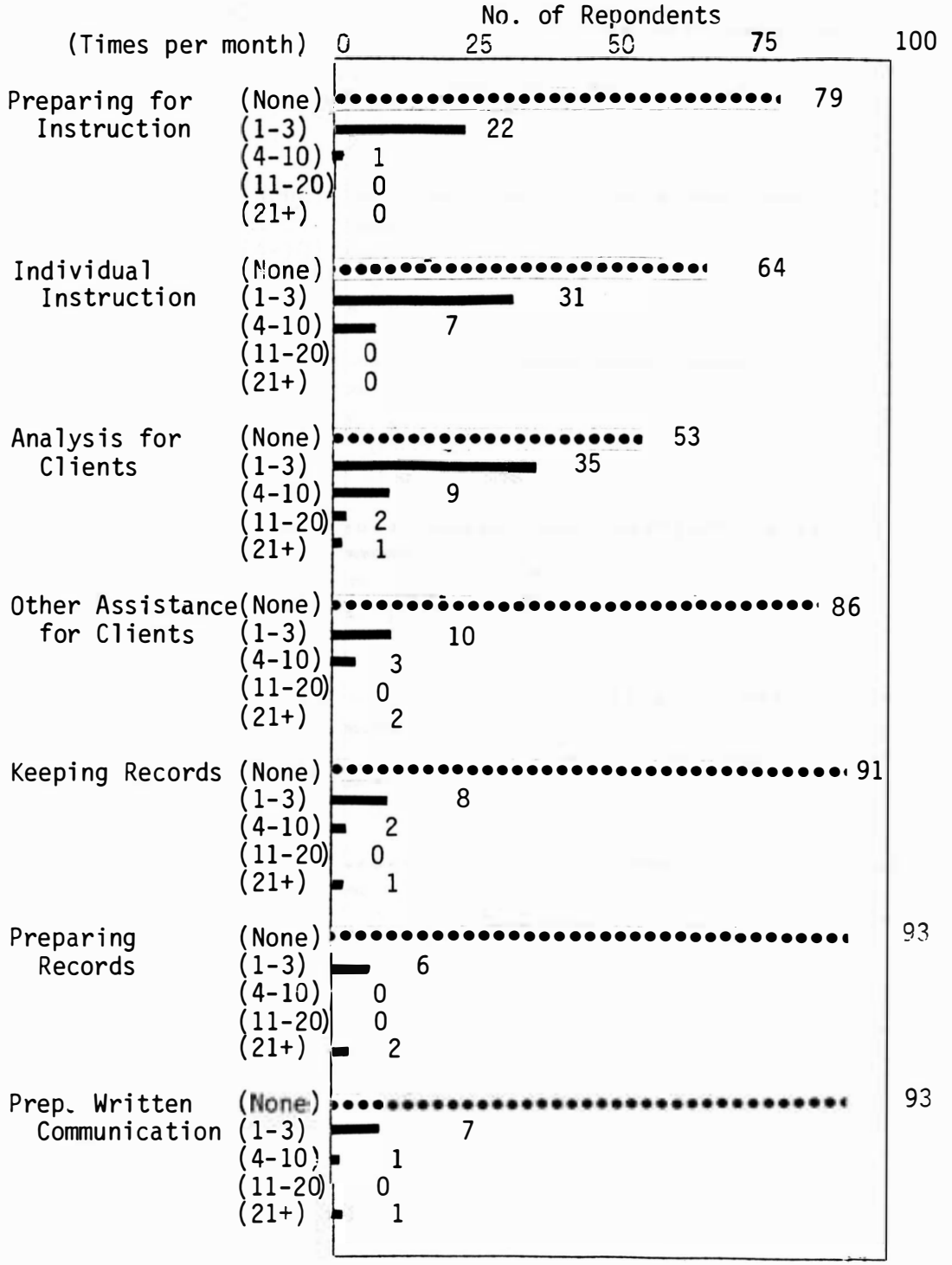
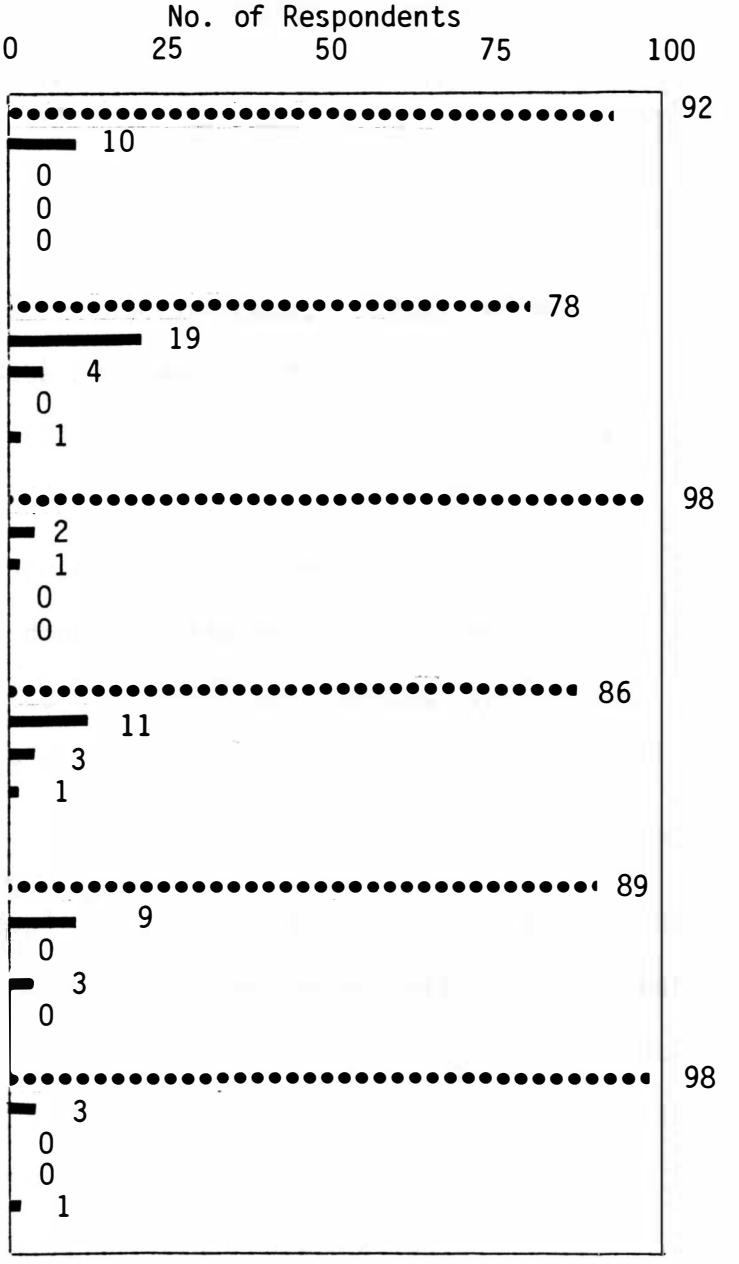


TABLE 8(cont.)

CURRENTS USES OF COMPUTERS



used application of the computer. Only three members(three percent) used a computer for this application. Fifteen respondents(15 percent) said they used a computer at least once each month to predict prices and trends.

Communication Applications

Only two applications were suggested under communications: information access from a data base and electronic mail.

Twenty-four respondents(24 percent) used the computer to attain information from a data base.

Ten staff members(ten percent) used a computer for electronic mail purposes. This raises doubts on the prospects of an early establishment of an integrated electronic mail system linking the land-grant university to the county extension offices.

Administrative Applications

Three administrative applications were listed in the questionnaire: keeping records, preparing records, and preparing written communication.

Eleven respondents(eleven percent) indicated they used a computer each month for record keeping purposes. Eight members(eight percent) prepared records on a computer, while another nine members(nine percent) used one for preparing written communication.

Miscellaneous Applications

Twelve respondents(12 percent) said they used a computer for data analysis. In addition, there were four extension staff members(four percent) that used a computer for an application other than those listed.

Factors Within the County Office

Extension county staff members were asked to rate computer use in their own county offices.

There were six areas rated on a scale of one to seven, with one being "Very Inadequate" and seven being "Very Adequate." The six areas included: 1) access to a computer; 2) available personnel to operate a computer; 3) budget to purchase necessary computer hardware and software; 4) administrative support to develop uses for a computer; 5) availability of training to learn how to use a computer; 6) time within work schedule to learn how to use a computer.

As shown in Table 9, county staff members felt access to a computer was the most adequate factor within the county office. However, a majority of the respondents were divided. Forty-two staff members (40 percent) said that access to a computer was very adequate in the county office, while 47 members(46 percent) said access was very inadequate.

On the question of available personnel to operate a computer, 51 respondents(49 percent) thought it was inadequate, and 35 members (34 percent) said it was adequate. About 70 percent of the county staff members said administrative support to use computers, the availability of training on computers, and time within work schedule to use a computer were inadequate.

The lowest rated area was the budget to purchase computer hardware and software. Eighty-three respondents(82 percent) felt the budget was inadequate. Only eight members(eight percent) said it was adequate.

TABLE 9

RESPONSES TO ADEQUACIES/INADEQUACIES OF FACTORS WITHIN THE EXTENSION OFFICE

Question: How adequate are the following in your extension office?

	Very Inadequate					Very Adequate		Missing	Mean
	1	2	3	4	5	6	7	9	
Access to Computer									
County Agents	18	6	3	2	3	4	19	1	3.981(+.144)
Home Economists	18	5	3	4	0	6	13	1	3.673(-.164)
Total	36	11	6	6	3	10	32	2	3.837
Available Personnel to Operate Computers									
County Agents	13	7	6	5	14	4	6	1	3.655(+.145)
Home Economists	14	5	6	13	1	5	5	1	3.347(-.163)
Total	27	12	12	18	15	9	11	2	3.510
Budget to Purchase Computer Equipment									
County Agents	31	10	3	4	4	1	0	3	1.924(+.043)
Home Economists	33	4	2	6	2	0	1	2	1.833(-.048)
Total	64	14	5	10	6	1	1	5	1.881

(continued)

NOTE: () = Difference from Total Mean

TABLE 9(continued)

RESPONSES TO ADEQUACIES/INADEQUACIES OF FACTORS WITHIN THE EXTENSION OFFICE

Question: How adequate are the following in your extension office?

	Very Inadequate 1	2	3	4	5	6	Very Adequate 7	Missing 9	Mean
Administrative Support to use Computers									
County Agents	14	11	12	6	5	4	1	3	2.868(+.068)
Home Economists	9	14	6	8	3	2	0	8	2.714(-.086)
Total	23	25	18	14	8	6	1	11	2.800
Availability of Training on Computers									
County Agents	8	14	9	10	6	5	1	3	3.038(+.025)
Home Economists	8	10	12	6	6	0	2	6	3.000(-.013)
Total	16	24	21	16	12	5	3	9	3.013
Time Within Work Schedule to Use Comp.									
County Agents	11	16	13	8	6	1	0	1	2.727(+.028)
Home Economists	16	9	9	12	0	3	1	2	2.666(-.033)
Total	27	25	19	20	6	4	1	3	2.699

NOTE: () = Difference from Total Mean

Own Personal Computers

Of the 106 county extension staff surveyed, only two said they owned a personal computer, 103 did not, and one response was missing.

Sources of Information for County Extension Personnel

In carrying out the mission of the land-grant university, county extension staff members used a number of sources to obtain information. To discover which sources were most used, respondents were asked what percentages they used each of these sources in their extension work during the 12 month period of the study.

One-to-one contacts(office visits, phone calls, correspondence) was the most frequently used source, accounting for an average of 29 percent of the time(See Table 10). County agents used this source 33 percent of the time, and home economists used it for an average of 25 percent of the time.

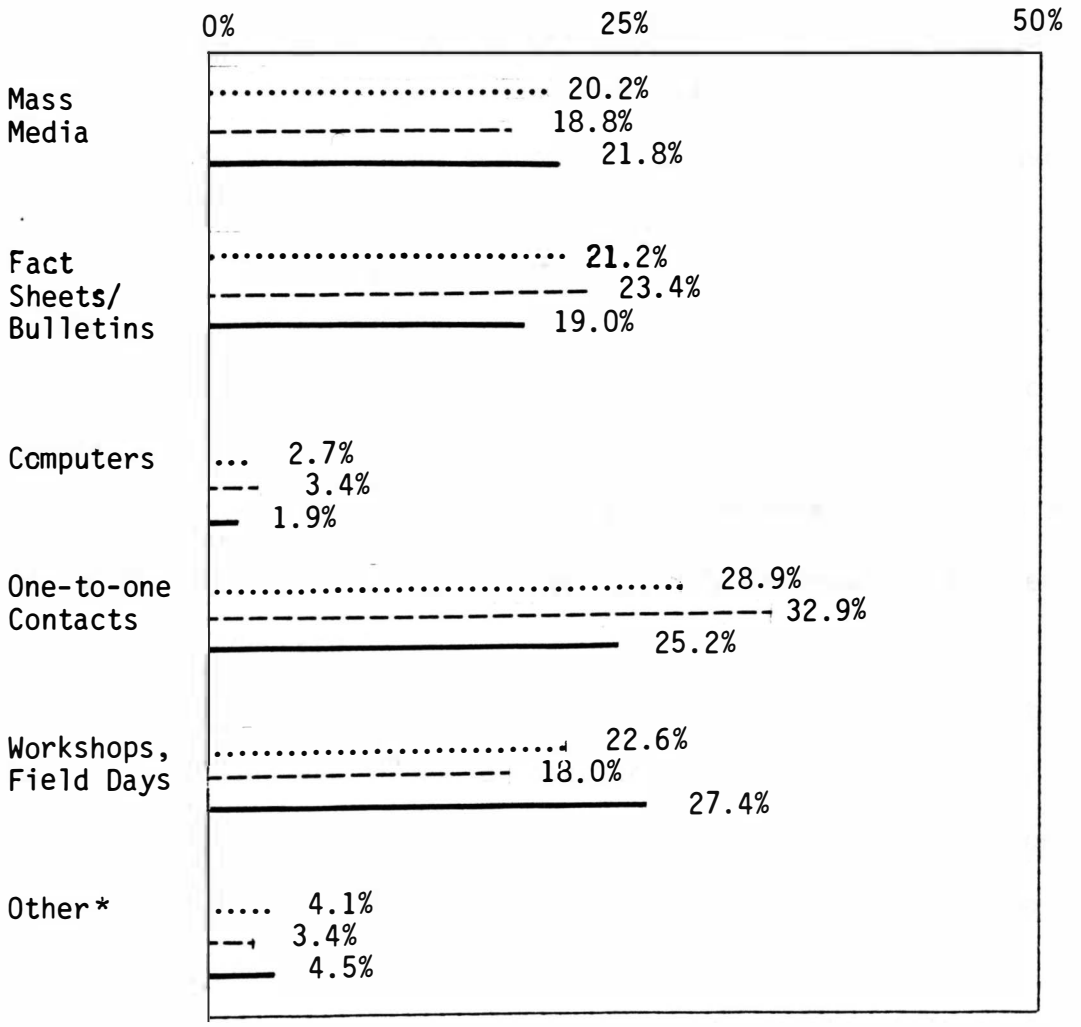
As a source of information to carry out extension work, the computer was the least used source of the categories listed. Staff members used it an average of less than three percent. County agents used it 58 percent more than home economists.

This suggests that the traditional communication methods employed by the land-grant university are still preferable to most county staff members as a means of obtaining desired information in their extension work.

TABLE 10

SOURCES OF INFORMATION FOR COUNTY EXTENSION PERSONNEL

Question: Indicate what percentage you used each of the following sources of information in your extension work.



.....Total Responses

--------County Agents

————————Home Economists

*"Other" category included items like: newsletters from specialists, non-extension resource materials, research plots, and symposiums, each accounting for less than one percent of the total.

Longevity of Using Computers

Respondents were asked the number of years and months they had used a computer within their extension work.

The average length of use by staff members was one year and seven months. County agents had used computers an average of two years and one month. Home economists had used computers an average of slightly more than one year.

Understanding of Computers

Both county agents and home economists were asked to rate their understanding in selected areas of computer use. This section contained four statements, each of which respondents rated on a scale of one to seven, with one being "Very Inadequate" and seven being "Very Adequate."

Both county agents and home economists felt their highest level of understanding was in how a computer could aid them in their extension work(See Table 11). Both county agents and home economists rated their lowest understanding in the area of how to develop a computer program.

Twice as many home economists as county agents felt their understanding on how to use a computer was very inadequate.

County agents felt their understanding was more adequate than their home economist counterparts in all four areas of this section. However, on the average, both groups felt inadequate in each of the areas listed on understanding of computers. This suggests a need for in-service training of extension personnel in the use of computers.

TABLE 11

UNDERSTANDING OF COMPUTERS

Statement: Rate your understanding of computers in the following areas.

	Very Inadequate 1	2	3	4	5	6	Very Adequate 7	Missing 9	Mean
When it is Cost Effective to Use a Computer									
County Agents	7	12	11	13	7	4	1	1	3.309(+.319)
Home Economists	15	8	12	12	1	2	0	1	2.640(-.350)
Total	22	20	23	25	8	6	1	2	2.990
How to Use a Computer									
County Agents	5	7	10	15	13	4	1	1	3.727(+.308)
Home Economists	10	11	8	12	5	3	1	1	3.080(-.339)
Total	15	18	18	25	18	7	2	2	3.419
How to Develop a Program									
County Agents	25	13	7	4	1	2	2	2	2.204(+.185)
Home Economists	30	9	4	5	1	1	0	0	1.820(-.199)
Total	55	22	11	9	2	3	2	2	2.019
Ways a Computer can Aid in Work									
County Agents	5	2	13	13	14	6	1	2	3.944(+.287)
Home Economists	8	5	13	13	4	4	1	2	3.333(-.324)
Total	13	7	26	26	18	10	2	4	3.657

NOTE: () = Difference from Total Mean

Hours Spent per Week Operating a Computer

Respondents were asked how many hours per week they use a computer to carry out extension work.

Of the 106 respondents, 55(52 percent) said they use a computer on a regular basis each week. Of these, 49(46 percent) said they use a computer from one to two hours a week. Responses in the other categories included: four(four percent) three to five hours per week; none, six to ten hours per week; two(two percent), over ten hours per week. Fifty-one extension members(48 percent) indicated they do not use a computer at all on a weekly basis(See Table 12).

When examined by job position, over twice as many county agents as home economists use a computer on a weekly basis.

TABLE 12

HOURS SPENT PER WEEK OPERATING A COMPUTER

Question: How many hours per week do you spend per week using a computer in extension work?

	None	1-2 Hours	3-5 Hours	6-10 Hours	Over 10
Home Economists	33	15	2	0	0
County Agents	18	34	2	0	2
Total	51	49	4	4	2

Comments about the Use of Computers in Extension

The final item in the questionnaire was an open-ended statement that allowed the extension member to express his or her views and opinions about the use of computers within the extension service.

Appendix B lists each of the comments from the questionnaires as they appeared. The comments are divided by county agents, home economist, state specialists, and administrators.

A frequently expressed concern pertained to the training of extension personnel on computers. Many requested further training in the use of the AGNET system, and overall training on computer use in general. Another frequent concern was in regard to implementing the computer into the extension service. Many of the respondents felt that SDSU was in danger of moving too slowly in computer development and may be left behind by other states developing similar systems.

Attitudes of Extension Personnel Towards Computers

There have been many applications suggested for computers in extension. As suggested earlier, the usefulness of these applications could depend upon the attitudes of extension members towards using computers.

To determine the attitudes, three broad functions of computers were examined: administrative, communication, and educational. Extension personnel were asked to respond to selected applications within each of these functions with "Of Little or No Use, Somewhat Useful, Quite Useful, and Extremely Useful."

Administrative Functions

Four specific administrative applications were presented in the questionnaire: 1) word processing; 2) keeping financial records; 3) maintaining mailing lists; 4) planning extension programs.

Table 13 shows staff members believed the most useful administrative application of a computer was for maintaining mailing lists. Of the respondents, 150(94 percent) said the computer was quite useful or extremely useful in maintaining mail lists. There is a substantial amount of newsletters and printed materials sent to clientele from the extension service each year. A computer being used to maintain and update these mailing lists could enhance this information delivery system.

When examined by individual extension group, the state specialists and administrators thought computers were more useful for word processing than for maintaining mailing lists. In total, 137 of the respondents(86 percent) felt the computer would be quite useful or extremely useful for word processing.

On the application of keeping financial records, 110 extension members(69 percent) said the computer would be quite useful or extremely useful. Home economists, on the average, believed this application to be more useful than did the other extension groups.

The least useful administrative application, according to the respondents, was planning extension programs. Within this category, home economists also rated this application higher than the other groups, and administrators rated it the lowest. Seventy-nine(55 percent)

TABLE 13

ATTITUDES TOWARDS POTENTIAL USES OF COMPUTERS-ADMINISTRATIVE FUNCTIONS

	Of Little Or No Use 1	Somewhat Useful 2	Quite Useful 3	Extremely Useful 4	Missing 9	Mean
Word Processing						
County Agents	0 (0%)	12(22%)	18(33%)	25(46%)	1	3.236(-.139)
Home Economists	1 (2%)	6(12%)	16(33%)	26(53%)	1	3.367(-.008)
State Specialists	0 (0%)	3 (7%)	14(31%)	28(62%)	0	3.556(+.181)
Administration	0 (0%)	1 (9%)	5(46%)	5(46%)	0	3·364(-.011)
Total	1(.6%)	22(14%)	53(33%)	84(53%)	2	3.375
Keeping Financial Records						
County Agents	3 (6%)	16(29%)	25(46%)	11(20%)	1	2.800(-.112)
Home Economists	4 (8%)	6(12%)	17(35%)	22(45%)	1	3.163(+.251)
State Specialists	6(13%)	11(24%)	14(31%)	14(31%)	0	2.800(-.112)
Administration	1 (9%)	3(27%)	4(37%)	3(27%)	0	2.818(-.094)
Total	14 (9%)	36(23%)	60(38%	50(31%)	2	2.912
Mailing Lists						
County Agents	0 (0%)	1 (2%)	16(29%)	38(69%)	1	3.673(+.079)
Home Economists	1 (2%)	1 (2%)	8(16%)	39(80%)	1	3.735(+.141)
State Specialists	2 (4%)	2 (4%)	14(31%)	27(60%)	0	3.467(-.127)
Administration	2(18%)	1 (9%)	2(18%)	6(55%)	0	3.091(-.503)
Total	5 (3%)	5 (3%)	40(25%)	110(69%)	2	3.594
Planning Programs						
County Agents	16(29%)	23(42%)	13(24%)	3 (6%)	1	2.055(-.014)
Home Economists	8(16%)	28(57%)	10(20%)	3 (6%)	1	2.163(+.094)
State Specialists	13(29%)	22(49%)	5(11%)	5(11%)	0	2.044(-.025)
Administration	4(36%)	6(55%)	0 (0%)	1 (9%)	0	1.818(-.251)
Total	41(26%)	79(49%)	28(18%)	12 (8%)	2	2.069

of the extension members said the computer was only somewhat useful for program planning, while 41 members(26 percent) said it was of little or no use.

Communication Functions

To determine what attitudes existed among extension member towards using computers for communication purposes, three applications were suggested: 1) providing rapid access to information; 2) send and receive extension mail; 3) send and receive non-extension mail.

Table 14 shows that, on the average, extension members felt the most useful communication application of the computer was providing rapid access to information. In total, 123 respondents (76 percent) believed the computer would be quite useful or extremely useful in this application. Within the category, state specialists rated this application lowest of the four extension groups.

For electronic mail purposes for extension, 33 respondents (21 percent) said the computer would be extremely useful, and 55 members said it would be quite useful. Fifty-three respondents (33 percent) said the computer would be only somewhat useful, and another 19 members(12 percent) felt it would be of little or no use for electronic mail purposes within the extension service.

The application of electronic mail outside the extension service received the lowest rating by all four extension groups. In total, 71 respondents(44 percent) felt the computer was only somewhat useful for this purpose, while another 38 members (24 percent) thought it would be of little or no use.

TABLE 14

ATTITUDES TOWARDS POTENTIAL USES OF COMPUTERS-COMMUNICATION FUNCTIONS

	Of Little Or No Use 1	Somewhat Useful 2	Quite Useful 3	Extremely Useful 4	Missing 9	Mean
Providing Rapid Access to Information						
County Agents	1 (2%)	11(20%)	19(35%)	24(44%)	1	3.200(+.063)
Home Economists	0 (0%)	8(16%)	21(42%)	21(42%)	0	3.260(+.123)
State Specialists	2 (4%)	15(33%)	14(31%)	14(31%)	0	2.889(-.248)
Administration	1 (9%)	0 (0%)	5(46%)	5(46%)	0	3.273(+.136)
Total	4 (3%)	34(21%)	59(37%)	64(46%)	1	3.137
Electronic Mail(Extension)						
County Agents	7(13%)	24(44%)	16(30%)	7(13%)	2	2.426(-.211)
Home Economists	4 (8%)	15(30%)	18(36%)	13(26%)	0	2.800(+.163)
State Specialists	7(16%)	10(22%)	19(42%)	9(20%)	0	2.667(+.030)
Administration	1 (9%)	4(36%)	2(18%)	4(36%)	0	2.818(+.181)
Total	19(12%)	53(33%)	55(34%)	33(21%)	2	2.637
Electronic Mail(Non-Ext.)						
County Agents	16(29%)	27(49%)	8(15%)	4 (7%)	1	2.000(-.193)
Home Economists	7(14%)	19(38%)	19(38%)	5(10%)	0	2.440(+.247)
State Specialists	11(24%)	20(44%)	8(18%)	6(13%)	0	2.200(+.007)
Administration	4(36%)	5(46%)	0 (0%)	2(18%)	0	2.000(-.193)
Total	38(24%)	71(44%)	35(22%)	17(11%)	1	2.193

Educational Functions

The final function listed in the questionnaire for potential uses of a computer in extension was for educational purposes. In this area, respondents were given three suggested applications: 1) solve problem solutions; 2) run decision-aid programs; 3) use as a tool to teach clients about computers.

Table 15 shows respondents felt the most useful educational application of a computer was as a decision-aid tool. In total, 118 extension members(73 percent) felt the computer would be quite useful or extremely useful for this application. The administrators, however, believed a computer could be more useful showing problem solutions than as a decision-aid tool. Only three administrators (27 percent) felt a computer would be extremely useful as a decision aid tool.

Ninety-one respondents(57 percent) said the computer would be quite useful or extremely useful in showing problem solutions. In using it to teach clients about computers, ninety-nine members (63 percent) felt it would be quite useful or extremely useful.

Attitudes on How Computers Will Affect the Extension Service

Some extension workers feel computers will be useful in their work and will have positive effects on the land-grant system. Others disagree. Extension personnel were asked to respond to ten statements about the possible effects of computers on the extension service. Responses were registered on a five point scale of: one(Strongly

TABLE 15

ATTITUDES TOWARD POTENTIAL USES OF COMPUTERS-EDUCATIONAL FUNCTIONS

	Of Little Or No Use 1	Somewhat Useful 2	Quite Useful 3	Extremely Useful 4	Missing 9	Mean
Show Problem Solutions						
County Agents	3 (6%)	16(30%)	25(46%)	10(19%)	2	2.778(+.053)
Home Economists	1 (2%)	18(36%)	17(34%)	14(28%)	0	2.880(+.155)
State Specialists	6(13%)	19(42%)	11(24%)	9(20%)	0	2.511(-.214)
Administration	2(18%)	4(36%)	1 (9%)	4(23%)	0	2.636(-.089)
Total	12 (8%)	57(37%)	54(33%)	37(23%)	2	2.725
Decision-Aid Tool						
County Agents	1 (2%)	8(14%)	17(31%)	29(53%)	1	3.345(+.264)
Home Economists	0 (0%)	10(20%)	21(42%)	19(38%)	0	3.180(+.099)
State Specialists	4 (8%)	13(29%)	14(31%)	14(31%)	0	2.844(-.237)
Administration	4(36%)	3(27%)	1 (9%)	3(27%)	0	2.272(-.809)
Total	9 (6%)	34(21%)	53(33%)	65(40%)	1	3.081
Teach Clients About Computers						
County Agents	2 (4%)	15(29%)	21(39%)	16(30%)	2	2.944(+.944)
Home Economists	3 (6%)	11(22%)	24(49%)	11(22%)	1	2.878(+.150)
State Specialists	13(29%)	8(18%)	13(30%)	10(23%)	1	2.455(-.273)
Administration	5(46%)	2(18%)	2(18%)	2(18%)	0	2.091(-.637)
Total	23(15%)	36(23%)	60(38%)	39(25%)	4	2.728

Disagree), two(Disagree), three (Agree), four(Strongly Agree), and eight(Undecided).

Table 16 shows the number of responses and percentages to each statement. The three strongest positive statements, on the average, were: 1) I feel I can use a computer in more ways than I currently do; 2) I feel computers can be useful in my work; 3) I want to learn more about computers. In each of these statements, over 96 percent of the respondents agreed or strongly agreed. This implies a willingness on the part of the extension staff member to learn more about computers and ways they can be used within the extension service.

The strongest negative attitude expressed towards computers was to the statement, "Until computer programs are improved or changed to better suit my area of extension, computers won't benefit me much." Sixty-three respondents(43 percent) agreed or strongly agreed with this statement.

This seems to imply that there is a general feeling among extension workers here in South Dakota that the computer software currently available is inadequate in fulfilling the needs of the extension service.

To the statement that "Computers will eventually hinder the two-way flow of information between the university and the client via the county extension office," 81 percent of all respondents either disagreed or strongly disagreed.

TABLE 16

ATTITUDES ON HOW COMPUTERS WILL AFFECT THE EXTENSION SERVICE

	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4	Undecided 8*	Missing 9*	Mean
Statement: "I feel computers can be useful in my work."							
County Agents	0 (0%)	1 (2%)	22(42%)	30(57%)	2	1	3.547(+.008)
Home Economists	1 (2%)	2 (4%)	18(38%)	26(55%)	3	0	3.368(-.071)
State Specialists	0 (0%)	1 (2%)	16(37%)	26(61%)	1	0	3.581(+.042)
Administration	0 (0%)	0 (0%)	4(36%)	7(64%)	0	1	3.636(+.097)
Total	1 (.6%)	4 (3%)	60(39%)	89(58%)	6	2	3.539
Statement: "Computers will likely depersonalize Extension's relation with its clients."							
County Agents	12(24%)	27(55%)	6(12%)	4 (8%)	3	2	2.041(+.048)
Home Economists	9(19%)	35(75%)	2 (4%)	1 (2%)	4	0	1.894(-.099)
State Specialists	14(34%)	16(39%)	7(17%)	4 (9%)	3	0	2.024(+.031)
Administration	2(20%)	6(60%)	1(10%)	1(10%)	1	0	2.100(+.107)
Total	37(26%)	84(57%)	16(11%)	10 (7%)	11	2	1.993
Statement: "Unitl computer programs are improved or changed to better suit my area of extension, computers won't benefit me much."							
County Agents	6(13%)	24(50%)	13(27%)	5(10%)	4	2	2.354(-.038)
Home Economists	5(11%)	19(41%)	13(28%)	9(20%0	4	1	2.565(+.173)
State Specialists	13(30%)	11(26%)	13(30%)	6(14%)	2	0	2.279(-.113)
Administration	3(27%)	4(36%)	2(18%)	2(18%)	0	0	2.273(-.119)
Total	27(18%)	58(39%)	41(28%)	22(15%)	10	3	2.392

*Not included in percentages

TABLE 16 (continued)

ATTITUDES ON HOW COMPUTERS WILL AFFECT THE EXTENSION SERVICE

	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4	Undecided 8*	Missing 9*	Mean
Statement: "Computers will make it easier to get information I need to carry out my work."							
County Agents	0 (0%)	2 (4%)	28(61%)	16(35%)	7	3	3.304(+.011)
Home Economists	0 (0%)	2 (5%)	24(55%)	18(41%)	4	1	3.367(+.074)
State Specialists	0 (0%)	7(18%)	17(44%)	15(39%)	2	0	2.333(-.040)
Administration	0 (0%)	1 (9%)	6(55%)	4(36%)	1	0	3.273(-.020)
Total	0 (0%)	12 (9%)	75(54%)	53(38%)	14	4	3.293
Statement: "I want to learn more about computers."							
County Agents	1 (2%)	1 (2%)	22(41%)	30(56%)	2	2	3.500(-.035)
Home Economists	0 (0%)	1 (2%)	15(31%)	33(67%)	1	0	3.653(+.118)
State Specialists	0 (0%)	3 (7%)	18(42%)	22(51%)	0	0	3.442(-.093)
Administration	0 (0%)	0 (0%)	5(46%)	6(55%)	0	0	3.545(+.010)
Total	1 (.6%)	5 (3%)	60(38%)	91(58%)	3	2	3.535
Statement: "I feel I can use a computer in more ways than I currently do."							
County Agents	0 (0%)	0 (0%)	20(39%)	31(61%)	1	1	3.608(+.012)
Home Economists	0 (0%)	2 (4%)	15(31%)	32(65%)	1	0	3.612(+.016)
State Specialists	0 (0%)	1 (2%)	19(42%)	25(56%)	2	1	3.535(-.061)
Administration	0 (0%)	0 (0%)	3(27%)	8(73%)	1	0	3.727(+.131)
Total	0 (0%)	3 (2%)	57(37%)	96(62%)	5	2	3.596

*Not included in percentages

TABLE 16(continued)

ATTITUDES ON HOW COMPUTERS WILL AFFECT THE EXTENSION SERVICE

	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4	Undecided 8 *	Missing 9*	Mean
Statement: "The use of computers will lead to a more centralized Extension Service-- thereby passing over county personnel."							
County Agents	11(24%)	24(52%)	9(20%)	2 (4%)	8	2	2.043(+.058)
Home Economists	7(17%)	28(68%)	2 (5%)	4(10%)	9	0	2.073(+.088)
State Specialists	16(39%)	16(39%)	7(17%)	2 (9%)	3	0	1.878(-.107)
Administration	3(33%)	5(56%)	1(11%)	0 (0%)	3	0	1.777(-.208)
Total	37(27%)	73(53%)	19(14%)	8 (6%)	23	2	1.985
Statement: "Though becoming easier, computers are still too difficult to use."							
County Agents	8(16%)	23(46%)	17(34%)	2 (4%)	4	2	2.260(-.035)
Home Economists	3 (7%)	32(70%)	8(17%)	3 (7%)	3	1	2.240(-.055)
State Specialists	9(21%)	15(38%)	14(33%)	4(10%)	3	0	2.310(+.015)
Administration	0 (0%)	7(64%)	1 (9%)	3(27%)	0	0	2.636(+.341)
Total	20(13%)	77(52%)	40(27%)	12 (8%)	10	3	2.295
Statement: "Extension's involvement with computers will only benefit the advantaged."							
County Agents	12(24%)	30(59%)	7(14%)	2 (4%)	2	3	1.980(-.020)
Home Economists	7(16%	26(59%	8(18%)	3 (7%)	6	0	2.159(+.159)
State Specialists	17(40%)	15(35%)	11(26%)	0 (0%)	2	0	1.860(-.140)
Administration	2(18%)	8(73%)	0 (0%)	1 (9%)	0	0	2.000(.000)
Total	38(26%)	79(53%)	26(17%)	6 (4%)	10	3	2.000

*Not included in percentages

TABLE 16(continued)

ATTITUDES ON HOW COMPUTERS WILL AFFECT THE EXTENSION SERVICE

	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4	Undecided 8*	Missing 9*	Mean
Statement: "Computers will eventually hinder the two-way flow of information between the university and the client via the county extension office."							
County Agents	10(22%)	25(54%)	9(20%)	2 (4%)	8	2	2.065(+.080)
Home Economists	4(10%)	31(80%)	2 (5%)	2 (5%)	10	0	2.051(+.066)
State Specialists	16(38%)	16(38%)	9(21%)	1 (2%)	2	0	1.881(-.004)
Administration	4(44%)	4(44%)	0 (0%)	1(11%)	2	0	1.985(.000)
Total	34(25%)	76(56%)	20(15%)	6 (4%)	22	2	1.985

* Not included in percentages

Analysis of Variance

Ten independent variables in the study were examined through analysis of variance to help explain the varying levels of use of a computer by county extension staff members.

Null Hypothesis Restated: There is no significant difference in the computer use of county staff members because of differences regarding the respondents' understanding of computers, position in extension, sex, computer training, longevity of computer use, education, age, attitudes about computers, factors expressed within county offices, and total years of service.

The null hypothesis was rejected at the .05 level of confidence in three of the ten variables. It was also rejected at the .10 level of confidence in two additional variables.

Table 17 shows each of the variables that were tested. The variable pertaining to the levels of understanding of computers was found to be significant beyond the .0001 level. This means that the differences found in the amount of computer use within the levels of understanding would not occur by chance in less than one in 10,000. In this case, the county member's perception of his or her understanding does significantly affect how much he or she uses a computer.

This does not say, however, what impact actual computer understanding has on computer use. But rather, it is the extension member's perception of his or her understanding that affects computer use.

TABLE 17

RESULTS OF ANALYSIS OF VARIANCE OF THE LEVELS OF USE OF THE AGNET COMPUTER SYSTEM BY COUNTY STAFF MEMBERS

Independent Variables	df	Sum of Squares	Mean Squares	F Ratio	Signif. of F
Understanding of Computers	6	83.7683	13.9614	9.135	<.0000
Position in Extension	1	33.0991	33.0991	16.499	.0001
Sex	1	29.3913	29.3913	14.356	.0003
Attended a Training Session	1	6.9457	6.9457	3.024	.0855
Longevity of Computer Use	4	20.8755	5.2189	2.183	.0869
Education	1	4.4167	4.4167	1.855	.1767
Age	4	13.3244	3.3311	1.434	.2295
Attitudes towards Computers	2	4.1879	2.0940	0.891	.4158
Factors within County Office	6	13.0169	2.1695	0.904	.4958
Total years of Service	1	0.3337	0.3337	0.131	.7188

The two variables of sex and position in extension were both significant at .0003 and .0001, respectively. The similarity found between these two variables was expected, since most county agents are male and most home economists are female.

The variable pertaining to county staff who had attended a workshop or training session in the previous 12 months showed a level of significance of .0855. This implies that whether a county staff member had attended a training session on computers does significantly affect the amount that staff member uses a computer. Once again, this finding stresses the importance of training on computers.

Finally, the variable of longevity of use of computers by county personnel was at a level of significance of .0869. This indicates that the length of time a county staff member has been using a computer to carry out extension work also significantly affects how much he or she uses a computer.

The other five independent variable were in excess of the .10 level of significance of the F-ratio.

ENDNOTES

[57]Interview with Don Peterson. AGNET Coordinator, Cooperative Extension Service. South Dakota State University. Oct. 4, 1983.

[58]Ibid.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

The Problem

The purpose of this study was to determine the attitudes of South Dakota extension personnel towards the use of computers within the extension service and to evaluate their use within the land-grant setting.

The study also made comparisons of levels of understanding, experience, and training with computers, sex, age, position in extension, education, and years of service with current amounts of computer use by county personnel.

Pertinent questions to the study included:

1. From the extension worker's perspective, does this computer technology hinder or ease the flow of information between extension clients and the university?

2. What are some of the best ways county agents and home economists might gain experience and information on the use of computers?

3. What are the differences in attitudes present among extension county personnel, university specialists, and administrators towards new computer technologies and their effects?

4. What kinds of communication and problem-solving functions are computers currently being used for in county extension offices?

5. How much time are county staff members currently using computers to carry out their extension work?

6. What factors within the county office(i.e. funding, access to computer equipment) might hinder or ease the development of these systems?

7. What sources do county staff members use to attain needed information in their work?

8. Finally, what impacts do factors like experience, understanding, and training on computers, as well as sex, attitudes, age, years of service, job position, and education, have on computer use by county extension personnel?

The results of this study could help the S.D. Cooperative Extension Service develop policy and direction for development of these systems. This information could also benefit extension services in other states considering similar systems.

In addition, information from the research can be used to provide a base-line study for future studies on the subject of computers in the land-grant setting. Based on the data from this study, research in future years could determine what progress has been made in implementing computerized systems into existing communication patterns, thus making short and long-term predictions for further development.

Design and Procedure of the Study

A questionnaire containing five sections was constructed for the survey. Each section dealt with a different aspect of computer use in the extension service.

Section one examined the various applications in which computers were currently being used. Sections two and three addressed the extension staff member's level of computer understanding, experience, and training, as well as sources of information and experience about computers and their use. Section four pertained to the attitudes of the extension staff member toward the adoption of computers within the land-grant setting. And finally, section five consisted of general information about the respondent's age, sex, years of service, education, and job position.

Additional data were obtained on the amount of use on the AGNET system by county staff through a computer-generated tabulation sheet from the central AGNET office at SDSU.

The study population were the three primary groups within the extension service: county extension personnel, state specialists, and administration.

The computer center located at SDSU was used to conduct frequency analysis of the data, and to aid in an analysis of variance in the dependent variable.

Major Findings

Of the 66 South Dakota counties surveyed in the study, 25(38 percent) have an AGNET terminal available full-time. Another 25 counties (38 percent) share terminals with a neighboring county. Of these, four (six percent) have a terminal available more than 50 percent of the time, ten(15 percent) have one half the time, and eleven counties

(17 percent) have a terminal less than 50 percent of the time. There were 17 counties(24 percent) that reported having no terminal at all.

The AGNET terminals received the most extensive use during the months of January, February, and March. During this time period, 52 percent of the log-ons and hours of use were recorded. This situation raised a concern over a potential congestion of use on the AGNET system and other systems like it. In total, county agents had 934 log-ons and 367 hours of use during the 12 month period of the study, more than five times more than the home economists. Some possible reasons for this difference in computer use were cited. One reason might be the lack of programs on AGNET. As of present, only eleven of the 117 programs available on the system are related to home economics.[59] This may limit the use. Also, requests from clientele for program runs in the area of home economics may be less than the requests for program runs in the agricultural-related programs. Another reason might be linked to the county staff members' perception of their understanding of computer. As was discovered by the data, understanding on computers does affect computer use.

On the question of what sources county staff members use to obtain information needed in their work, one-to-one contacts with the information source was the most used source with 29 percent of the total. Computers were used less than three percent of the time to obtain needed information. This would indicate that while computers are beginning to become a source of information, the traditional information

channels of the land-grant university are still a more desirable source for most county extension personnel.

In longevity of use on computers, it was discovered that county agents had used computers longer than home economists. They averaged two years, one month, while home economists had an average of slightly over one year.

The study also examined the amount of time county staff are spending each week to operate a computer. Fifty-one staff members (48 percent) indicated they do not use a computer at all on a regular basis. Of these, 33(65 percent) were home economists, and 18(33 percent) were county agents. Forty-six percent of the respondents said they use a computer in the extension work from one-to-two hours per week. Sixty percent of these were county agents, and 31 percent were home economists.

It was discovered in the study that over 54 percent of the county staff surveyed said the workshop was the best source of experience on computers. In addition, 51 percent indicated the workshop was the single best source of information about computers.

In the area of attitudes of extension members toward potential uses of computers, three broad functions were suggested: administrative, communication, and educational. Under administrative functions all groups of extension said the computer could best be used for maintaining mailing lists. With the substantial amount of newsletters and other printed material mailed each month to clientele(farmers, homemakers, 4-H youth and leaders) from the extension service, the

prospects of using a computer to maintain and update these mailing lists may enhance this information delivery system.

In communication functions, extension staff members said the computer was best suited for providing rapid access to information This also may enhance the possibilities of establishing a data base at the state level in which the county staff could access information for clientele through the AGNET system.

Under educational functions, all four groups agreed that the computer can be best used as a decision-aid tool. This was an expected response since the current most used application of the AGNET terminal was analysis for clients. The computer seems to be well suited for carrying out this particular service provided by extension.

In the attitudes of extension members toward the effects of computers on the land-grant mission, it was discovered that the most positive response by county agents and administration was to the statement "I feel I can use a computer in more ways than I currently do." Home economists responded most favorably to the statement "I want to learn more about computers," while state specialists were most favorable to the statement "I feel computers can be useful in my work." All three statements imply a willingness on the part of the extension personnel to learn more about computers and how they can be used in their work.

The most negative response by extension members was to the statement "Until programs are changed to better suit my area of extension, computers won't benefit me much." This seems to indicate a general

feeling among respondents that the computer software currently available is inadequate to fulfill the needs of the extension service.

The study data revealed 70 percent of all respondents disagreed or strongly disagreed with the statement "Computers will eventually hinder the two-way flow of information from the university to the client via the county staff. This suggests that extension personnel generally feel the computer will not hinder the flow of information from the university to the clientele.

Finally, to the question of what impacts certain factors like experience, understanding, and training on computers, sex, attitudes, age, years of service job position, and education have on computer use, five factors were discovered which significantly controlled the amount of computer use by county personnel. These five factors were by order of significance: understanding of computers; position in extension, sex; training on computers; and experience or longevity of use. These findings suggest the following:

1. Understanding of computers and how they can be used does affect use.

2. There are some positions within extension which are more conducive to using a computer than in other positions.

3. Being trained on computer use is a valuable step in facilitating their use. One reason may be a familiarization with the computer, thus alleviating fears and intimidation.

4. Experience does affect computer use. This would suggest that as a person becomes familar with a computer and begins to use

it in actual application, the more likely he or she will continue to use it as a tool.

Profile of the Extension Computer User

Based on the data presented in the study, a profile of the extension computer user can be constructed.

From the findings of the analysis of variance test, the person most likely to use a computer in the S.D. Cooperative Extension Service is a male county agent. This agent would have been working with computers for several years in his extension work.

In addition, he would feel generally adequate in his understanding about a computer and how it can be used Finally, this county agent would have been to a training session or workshop on the use of computers in the past year.

Conclusions

The study revealed several factors which affect the use of computers by county extension personnel.

Through analysis of variance of computer use, it was discovered that an extension members perception of his or her understanding of computers does significantly affect the amount he or she uses computer. This fact could be helpful when planning workshops or training sessions. Information presented in these workshops should be focused on the items which facilitate the understanding of the extension member on computers. The study did not, however, examine what impact actual computer knowledge had on computer use.

The study also showed that sex and position in extension were both factors that significantly affected the use of the computer. It was discovered through frequency counts that county agents used the computer five times more than home economists. The reasons for this difference is not known, however, there are some possible explanations.

One possible reason might pertain to the nature of the AGNET computer system itself. Only eleven of the 117 programs currently available on the AGNET system are related to home economics. Thus, the opportunity for a home economist to use the AGNET system is limited.

Another explanation of the difference in use might lie in the attitudes expressed by home economists. For example, understanding has been shown to have an impact on use. In all four areas of understanding on computers in the questionnaire, home economists felt less adequate about computers than did county agents.

Finally, a reason might be that the request for program runs for clientele are far below the number of requests for program runs in the agricultural areas. This too, could explain the difference.

It was also discovered in the study that attending a workshop or training session and experience or longevity of use on computers both significantly affected the amount of use. This would indicate as an individual begins to use a computer, he becomes familiar with its functions, he will consequently use it more. This finding emphasizes the importance of staff members becoming familiar with

computers if the extension service plans on integrating them into the current land-grant setting.

In other areas of the study, county personnel reported certain months of the year(January, February, March), when more than half of the total use of the AGNET system for the year was recorded. This is the planning time of the year in which many of the AGNET programs for farmer clientele are run. This situation also raised a question as to the danger of a congestion of use on the system and other systems like it. This also affects the cost of operating and maintaining a system like AGNET, since in order to handle the peak months, equipment and personnel have to be increased.

While access to a computer may be an important consideration in the implementing a computerized system, both county agents and home economists in the study said they are more concerned with other factors such as budget to purchase additional computer equipment; scheduled time to use a computer; administrative support to develop computer systems; and availability of training programs and trained personnel on computers. Particular attention should be paid to these areas as SDSU begins development of a computer-based information system. Also policy-makers of the extension service may need to consider diversion of funds as computer needs increase.

It also became apparent in the study that while some extension staff members are beginning to use computers as a source of information in their work, the majority of information is still attained from traditional sources like one-to-one contacts, workshops, field days, factsheets, and bulletins.

The study also identified the workshop as a valuable tool in which to help county members gain experience and information about computers. One of the primary tasks of the extension service in developing a computer-based information system will be insuring that the users of the system, extension personnel, are adequately trained and understand computers. For extension services on a limited budget in which to conduct such in-service training, the computer workshop seems to be a very effective training tool.

Recommendations for Further Research

Because this study only dealt with computer use within the extension service of one state, additional studies might focus on other areas of concern in regard to computer use in extension services of other states.

This study raises a number of additional questions about computers that needs to be addressed before specific guidelines can be established:

1. Why is there such a large difference in the amount of computer use between county home economists and county agents?

2. What additional types of computer programs might facilitate the use of computers by various groups like home economists within the extension service?

3. What kind of steps can be taken to "diffuse" the use of computers during peak months of January, February, and March, thus preventing "jamming" and "over-crowding" on these systems?

4. What kind of computer services do extension clientele want and expect from the land-grant university?

5. It was determined that levels of understanding, training, and longevity of use affect use, but what is the nature of those effects?

Since much of the data in the study was basic data, future research could help determine what progress has been made in the implementation of these computer-based systems, and what have been some of the impacts of these systems on traditional communication patterns in the land-grant setting.

APPENDIX A

ATTENTION: EXTENSION COUNTY AGENTS, HOME ECONOMISTS, SPECIALISTS, AND ADMINISTRATION

Enclosed you will find a survey that is part of a study being conducted which evaluates the current uses and attitudes about computers in the extension service. There are several other land-grant universities in our region conducting similar studies.

The questionnaire contains 21 items and takes approximately 15 minutes to complete. Once you have finished it, mail it back to me in the addressed envelope enclosed. Please think through each item carefully before answering. County staff have five parts in their questionnaire, while administration and specialists have only parts four and five. I would like to have them back within a three week time-frame. That would put the deadline at June 27th.

I want each of you to know that I appreciate your cooperation in this survey. There is one term that needs to be clarified. Unless otherwise indicated, the term "computer" entails the AGNET terminals, as well as small business and personal computers your office may be using. (County staff only) In section two, there is a boxed item asking for the percentage of use on the AGNET system which was done by you or for you. In other words, if your county used the AGNET system 100 hours last year, how much of that 100 hours were you responsible for? You may have to discuss this matter with your counterparts in the office to determine the percentages. I will then compile the questionnaire from each county and tally the percentages.

Other than that, if you have any questions, feel free to contact by letter or phone. Once again, thank you very much!

Sincerely;

Jerry D. Jorgensen

Jerry D. Jorgensen
Radio/TV Specialist

Computer Use and Attitude Survey

Instructions: Answer each item in this survey and, when completed, mail it in the return envelope enclosed. Thank you for your cooperation.

PART I - CURRENT APPLICATIONS OF COMPUTERS IN EXTENSION

1. Circle the number of times you use a computer per month for each of the following uses.

	(Numbers of times)				
a. Preparing for instruction.....	None	1-3	4-10	11-20	Over 20
b. Individualized instruction.....	None	1-3	4-10	11-20	Over 20
c. Analysis for clients.....	None	1-3	4-10	11-20	Over 20
d. Other assistance to clients ...					
Specify_____.....	None	1-3	4-10	11-20	Over 20
e. Keeping records.....	None	1-3	4-10	11-20	Over 20
f. Preparing reports.....	None	1-3	4-10	11-20	Over 20
g. Preparing written communication (letters, memos, ect.).....	None	1-3	4-10	11-20	Over 20
h. Electronic mail.....	None	1-3	4-10	11-20	Over 20
i. Using information in data bases and information networks....	None	1-3	4-10	11-20	Over 20
j. Model building.....	None	1-3	4-10	11-20	Over 20
k. Predicting prices, trends, ect.	None	1-3	4-10	11-20	Over 20
l. Data analysis.....	None	1-3	4-10	11-20	Over 20
m. Other (specify)_____	None	1-3	4-10	11-20	Over 20

2. Indicate what percentage you used each of the following as a source of information in your Extension work in the past year?

_____% Mass Media (Newspacket, radio, ect.)
_____% Fact sheets, circulars, bulletins and other Extension literature.
_____% Computers
_____% One-to-one contacts (office visits, phone calls, correspondence)
_____% Workshops, conferences, county meetings.
_____% Other (specify)_____
100 % Total

PART III - THE EXTENSION OFFICE AND INFORMATION SOURCES

10. How adequate are the following in your Extension office?

	Very Inadequate						Very Adequate
a. Your access to a computer in the Extension office.	1	2	3	4	5	6	7
b. Availability of personnel within the office to operate computers.	1	2	3	4	5	6	7
c. Your budget to purchase computer software and hardware.	1	2	3	4	5	6	7
d. Administrative support to develop computer systems.	1	2	3	4	5	6	7
e. Availability of training programs on computers.	1	2	3	4	5	6	7
f. Time within your work schedule to learn the uses of a computer.	1	2	3	4	5	6	7

11. What amount of computer experience have you gained from the following?

	None		Some		Much
a. Undergraduate course	1	2	3	4	5
b. Graduate course	1	2	3	4	5
c. Previous job position	1	2	3	4	5
d. Current job position	1	2	3	4	5
e. Workshop or training session	1	2	3	4	5
f. Other (specify)_____	1	2	3	4	5

*Of those listed above, circle the letter of the one in which you gathered the most experience

12. What amount of information on computers have you gained from the following?

	None		Some		Much
a. Magazines and Newspapers	1	2	3	4	5
b. Books and Manuals	1	2	3	4	5
c. Computer dealers	1	2	3	4	5
d. Attended a computer exhibit at fair or expo	1	2	3	4	5
e. Taken a workshop or shortcourse	1	2	3	4	5
f. From co-workers	1	2	3	4	5
g. Other (specify)_____	1	2	3	4	5

*Of those listed above, circle the letter of the one in which you gained the most information

PART IV - ATTITUDES ABOUT COMPUTERS

There have been many applications suggested for computers in Extension. In what ways do you feel a computer can be useful to you in carrying out your extension job? For each of the applications listed below, indicate how useful a computer could be in your extension work. In answering these questions, assume the necessary equipment and programs are available.

	Of Little Or No Use	Somewhat Useful	Quite Useful	Extremely Useful
13. Administration/Office Functions:				
a. Word processing (electronic typing) for correspondence, manuscripts, newsletters.....	1	2	3	4
b. Keeping financial and other administrative records.....	1	2	3	4
c. Maintaining mailing lists and addressing mailings to clients.....	1	2	3	4
d. Planning programs and scheduling my time.....	1	2	3	4
14. Communication Functions:				
a. Providing rapid access to specific information I need, when I need it....	1	2	3	4
b. Sending and receiving messages within Extension(electronic mail).....	1	2	3	4
c. Sending and receiving messages with clients and others outside Extension..	1	2	3	4
15. Educational Functions:				
a. Use to show problem solutions in meetings and demonstrations.....	1	2	3	4
b. Run decision-aid programs to help individual clients.....	1	2	3	4
c. Use as a tool to teach clients how to use the computer.....	1	2	3	4

16. Some Extension workers feel computers will be useful in their work. Others disagree. Indicate to what extent you agree or disagree with each of the following statements. (Circle one answer for each statement)

	Strongly Disagree	Disagree	Agree	Strongly Agree	Undecided
a. I feel computers can be useful in my work.....	1	2	3	4	8
b. Computers will likely depersonali ze Extension's relation with its clients.....	1	2	3	4	8
c. Until computer programs are improved or changed to better suit my area of Extension computers won't benefit me much..	1	2	3	4	8
d. Computers will make it easier to get information I need to carry out my work.....	1	2	3	4	8
e. I feel I can use a computer in more ways than I currently do.....	1	2	3	4	8
f. I want to learn more about computers	1	2	3	4	8
g. The use of computers will lead to a more centralized Extension Service--thereby passing over county personnel.....	1	2	3	4	8
h. Though becoming easier, computers are still too difficult to use.....	1	2	3	4	8
i. Extension's involvement with computers will only benefit the advantaged.....	1	2	3	4	8
j. Computers will eventually hinder the two-way flow of information between the university and the client via the county extension office.....	1	2	3	4	8

PART V - GENERAL INFORMATION

17. Sex
    a. Male
    b. Female

18. Age
    a. Under 26
    b. 26-35
    c. 36-45
    d. 46-55
    e. Over 55

19. Position in Extension
    a. County Agent
    b. Home Economist
    c. State Specialist (Under 50% Extension)
    d. State Specialist (50% - 100% Extension)
    e. Administration

20. Total years employed by Extension Service (include those years in other state extension services.)
    a. 5-10
    b. 11-15
    c. 16-20
    d. 21-25
    e. Over 25 years
    f. Less than 5

21. Education
    a. BS/BA
    b. MA/MS
    c. Ph.D.
    d. Other(specify)_____

Comments:(You may make any comments about the use of computers in extension)

_____

_____

_____

_____

_____

_____

APPENDIX B

APPENDIX B

COMMENTS

From Home Economists

Before computer service is offered to clients, personnel must be grounded in operation, application and interpretation..

I feel the computer is a very useful tool, but the county will not justify the cost unless it is recommended by the state.

Please offer more computer workshops. The training we received in Mitchell was excellent. S.D. needs to get the ball rolling and get computers in every county office. Specialists will need to develop programs. An area computer specialist would be a great advantage.

I think we have to get with it. Lack of knowledge about them limits ability to answer these questions real accurately.

We've had our own computer for about one year. It was such a hassle scheduling on district basis. My time priority has not been directed towards computers. (My) goal is to get with it this next year.

I enjoyed the computer workshop this spring on computer. Most of what I know about computers is from this workshop.

Yes, there's a real need for S.D. Extension to get on the ball and inform county staff about computers and develop both home economics and agriculture programs. I have decreased my use of AGNET because new release program no longer has relevant home economics information on it. Let's get a combined effort going in S.D.-so there is some similarity between counties. If this doesn't come from administration soon, counties will go ahead on their own. Then years down the road, we'll wish we had combined our efforts.

Thanks for the training on computers out in the field-it was much needed. I hope to get computer graduate credits in the future. Also, hope to work with youth on computer programming.

I would like more information on home economics in computers.

We do not have access to a computer terminal at all times as it is located in another county making it very unhandy to use.

I feel that workshops that are mandatory for each extension worker would be very informative. Also, we need to have more exposure to computers.....even in small communities.

It seems like one more thing we think we have to jump into without thinking through how it can be helpful, costs involved, ect. I feel a thorough training is very important-more than a five-hour workshop. My client response has been "we can't afford that."

Need more continuity in computer systems so software can be exchanged.

Extension Boards need to be informed on how computers can be used-they need to hear it from someone other than the county staff. Maybe at the Area Extension Board Meetings would be a good time.

Training for personnel at the state level in the use of computers is very minimal. Most of us don't even know very much about how to use AGNET when we don't have a terminal available in our office.

I can see all the ways mentioned being very useful by implementing computers. My question: What do I give up in programming in order to incorporate computer use with clientele????

From County Agents

Until computers have more practical application to office operations, I really don't need one. Too often they are considered as toys.

Teaching the public with computers will require very well designed approaches. Being a "computer whiz" on an individual basis mean little or nothing to the total extension program. At some point we need to get our act figured out before we start inviting the public to seek something from extension that it can't deliver.

Many very good commerical software programs already are available for farmers. Computers will encourage farm analysis type record keeping. Computer application MUST BE the workable and feasible type which justify themselves. Extension will have have a tremendous job in putting "over the message" as we must remember most information is written donw somewhere right now-yet people still need guidance in using the information.

Many agents need the beginner's course in using computers. The workshops I have attended were aimed at people experienced in computer use and meant very little to me.

Computers are the coming thing. If extension does not make use of computers and programming, our clientele will by-pass the county offices on all areas. We already are seeing more and more direct contact with the university by the chemical and fertilizer dealers. They want answers right now, why go to the middle man.

With the rapid turnover of agents we have seen in the past it might hinder getting full use of a computer especially in the smaller counties. We need more training in computers even after we purchase them.

Computers are the way of the future. Decision regarding hardware and software need to be made so we do not end up with computers that are incompatible but in which a large investment has been made.

I feel that computers are the information source and news media of the future. If extension personnel are not adequately trained to utilize computers as education and communications tools, we can expect to lose our authority that comes from having the most current and timely information available.

It would be good for all extension office to have (a computer). Maybe it could set up to eliminate some seldom used fact sheets. Punch in the code of a subject and read it on the screen or printout. The messenger and news releases could be used this way.

My experience with computers has been self taught due to clients' need for information in use, material and information material. It is extremely necessary not to miss the boat with computers as I feel it's as important as the telephone which most of us cannot get along without.

I feel that computers are going to be extensively used in agriculture and I feel the extension service should be prepared to deal with that situation and should lead the way.

Our county commissioners have purchased a computer which all our tax and assessment records are on. The extension office has access to this computer and plan to use it more in the future. Time seems to be the biggest problem-the computer is available but our time is too limited to utilize the computer. I guess we need to make time.

Some careful consideration should go into developing a computer system for the extension service here. A helpful computer system would be great but computerizing everything just for the sake of computerization could be, in my estimation, an expensive mistake.

I think we are getting pulled into computers earlier than computer hardware and software is ready for extension and the majority of people are ready for computers. The time is not right.

I believe very strongly that computers will become as essential and as common as many of our current necessities of life(ie. electricity, indoor toilets, ect). Computer training for extension personnel should be a top priority and should be a continuous, on-going project. A good start in this area would be to devote Annual Conference this year to a program geared entirely around computer training.

Extension needs to be a leader in the use of micro-computers in agriculture and home economics. Currently the cost of both hardware and software is the hold up. An extension office at the university needs to set up a program evaluation service and possibly a software library so county offices can review programs before purchasing them. They could also advise clients on programs.

Programs need to be developed that clientele can make use of. Some programs developed in other parts of the country do not apply here.

In my opinion, the computer needs to be used more to access information. I have lots of information available in my office and much more is available at the university. As county agents we are asked for expertise in a multitude of areas. Being able to find this information with the aid of a computer would be a tremendous asset. Today, many questions could be much bettered answered if the information could be found.

We need computers in order to keep up with the fast pace of agriculture and home economics. We need to process information faster and access it faster. I'm looking forward to computers in the extension service.

If the funds were available, I'm certain more county and state staff would have computers. Right now-counties are facing "county funding" of a percentage of salary of agents. Until we get over this situation, I do not expect many counties to get set up with larger computer systems.

We have offered program the past two years, making available our AGNET terminal for training on as a service to farmers. To date the demand for using the terminal has not been evident. Without using it for the P.I.K. program in agriculture, our use is minimal. When there more demand for its use, I will spend more time on the terminal.

S.D. Extension Service is already two years behind. We need to be leaders and innovators rather than followers.

We are, like normal, late. Computers are becoming a part of modern agriculture and I think extension service has to make some recommendations rather than "these are things that a computer can do and leaving it there."

Projected estimates indicate that in four years, 75 percent of all farmers will have micro-computers. Why don't we have an extension micro-computer specialist? Also, since the extension service works with such a wide clientele, a large library of programs will be needed at the county offices. This will be extremely expensive if there is no standardization. We must begin to develop methods which make software available to counties at a reasonable price.

From State Specialists

There is only one problem concerning extension and computers-the lack of computers, especially micro's.

Essential....the way of the future....mandatory for survival. Get with it....keep up with the technology or get lost and die.

I have difficulty taking the initiative or finding the time to learn more about computers. I know they would benefit me, but I haven't been able to set aside the time to learn more about computers.

If extension doesn't get involved we will become even more out-of-date.

Computers enable a specialist to retrieve data to answer questions or accumulate data to include in extension publications. Computers cannot replace county extension staff.

If we don't become competent(in computers), we will lose additional clientele who want this service.

Computers will lead to bypassing the county for some things possibly, unless all counties have adequate hardware available and agents who are really interested. Much still will remain that needs the personal touch.

While computers are a tool, we must guard against believing that they can make management decisions for us.

If hardware was available with graphics capability, I am certain the use of computers would enhance output of useful information in my area of responsibility.

Until all counties have terminals, it makes it difficult to use computer programs on AGNET or write programs.

Computers can allow agents, specialists and secretarial personnel more time for original thought and people communication.

Before I can make good decisions about the computer, I need to know more about them and have some programs developed involving my discipline.

Most 14 and 15 year olds know more about computers than most faculty. Despite the low cost of personal computers, we don't seem to be acquiring them. We can't very well use them if we don't have them, right?

Administration

Whether or not the county extension office is bypassed or not depends upon many factors. They include: whether to county office is actively involved with micro's; how much specialists get involved with micro's and micro users; and, what kinds of emphasis administration has on micro's. In any case, computers are here. We can get involved or be left behind.

We are always scared of what we do not understand, and at present my understanding of computers is minimal. I want to learn more about computers and available uses.

We need a plan for placement and compatibility of computers across the state. We need a computer specialist.

Computers will not depersonalize or remove county personnel-because the computer does not know "Joe Blow"...or his management capability. All the computer can do is store and regurgitate information....to help in making decisions. But the agent or specialist still has to help fit this to the individual client.

Biggest problem for people is understanding the terms used. Many new terms have been coined by computer folks that relate to tasks we have done for years.

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